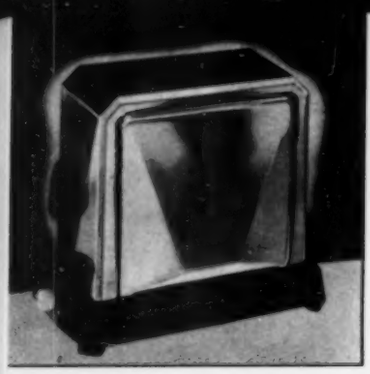
MODERN PLASTICS

JUNE 1935



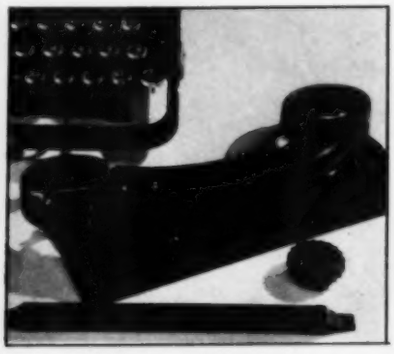
EAT-PROOF: The Durez base on this 'octor and Schwartz toaster resists contin- ed 300° heat. Even heats up to 400° will ot affect Durez' smooth, lustrous finish.

INTRICATE SHAPES: This volume control produced by Remler is an intricate bit of molding. Lugs, bushings and inserts are molded into the pieces in one operation.

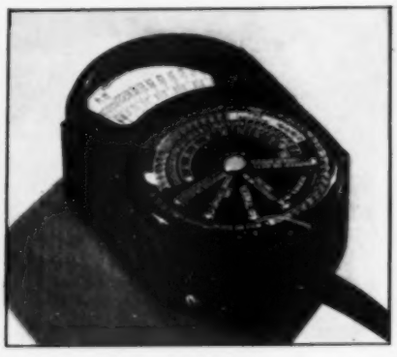
RESISTANCE TO MOISTURE: This water closet float ball will not crack or split though constantly submerged. Chemical salts in the water cannot corrode Durez.

DENT-PROOF: The molded Dure tain lid is dent- and breakage Though constantly slammed shut w cream scoops, its finish is not ma

HEMICALLY INERT: Merck found that etal caps corroded when used for their escription chemicals. Now they use olded Durez closures which are unaf- cted by active reagents.

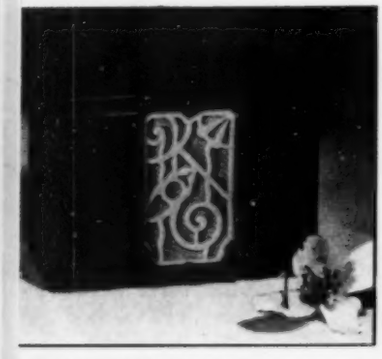


NON-CHIPPING FINISH: Constant wear will not change the shiny finish of these molded typewriter parts. Unlike painted finishes, the Durez surface is part of the piece...not applied. It can not chip or peel.



NEEDS NO POLISHING: When a Durez piece leaves the mold...it is both *made* and *polished*. The hard, shiny surface is automatically produced in the molding operation, and requires no additional finishing.

SMOOTH SURFACE: Durez' sle face is pleasant to the touch. And b Durez conducts heat slowly, finge be burned when they touch the handle of this glass tea pot.

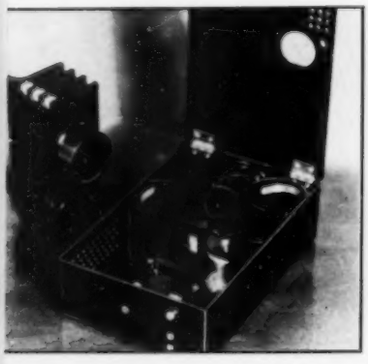


ERMANENT LUSTRE: Smooth, beautiful stre is an integral part of every Durez olding. Constant use will not affect the ard non-porous surface finish.

STRENGTH: The molded chassis of this Bates numbering machine has ample strength to withstand a constant pounding, yet it is extremely light in weight.

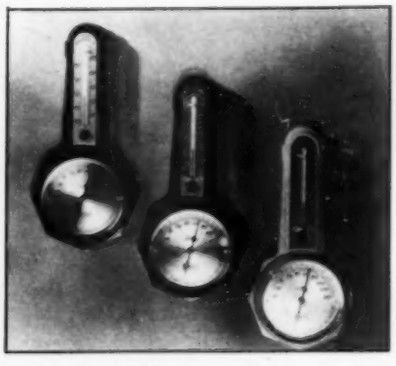
PRECISION: Such scaled panels as this must be absolutely accurate. When molded of Durez, the millionth scale will be exactly like the first.

RESISTANCE TO WEAR: This Ba mouthpiece receives rough hand its hard lustrous Durez finish indefinitely and show no signs



IGHT WEIGHT: Durez weighs less than ny metal, yet is structurally strong. This ocket projector, molded of Durez, can e easily carried despite its size.

ELECTRICAL INSULATION: Durez' dielectric strength protects this Mallory ignition coil from arcing paths caused by grease and moisture.



LASTING COLOR: Durez color is not a surface finish like lacquer or paint. It goes all the way through the piece, and cannot wear off or chip. Many colors available.

PROTECTION: Stu dy, moisture and practically unbre kable. Durez are popular for pac ging such instruments as this m crometer.

DUREZ

THE MODERN MOLDING COMPOUND

DUREZ Invites Correspondence from manufacturers of electrical devices, thermometers, motor-car parts, novelties, office equipment and machines, optical goods and scientific instruments, store equipment, sporting goods, notions and others. There is o obligat all, just write us—tell us wh you mak what your problems are—a we'll hel in every way we can. Gen al Plastics 356 Walck Road, North T awanda.

JUNE 1935

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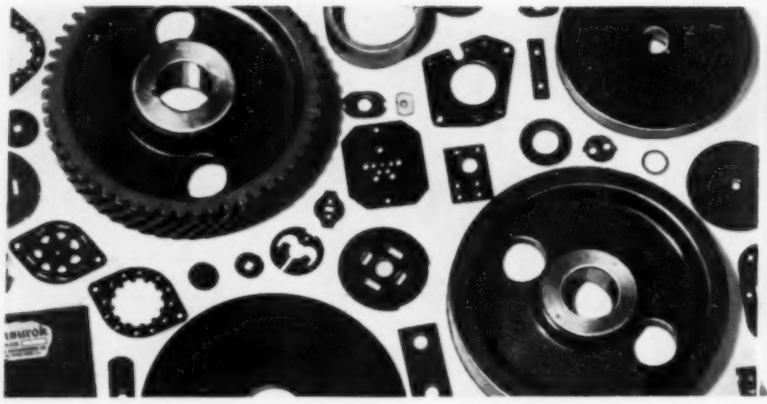
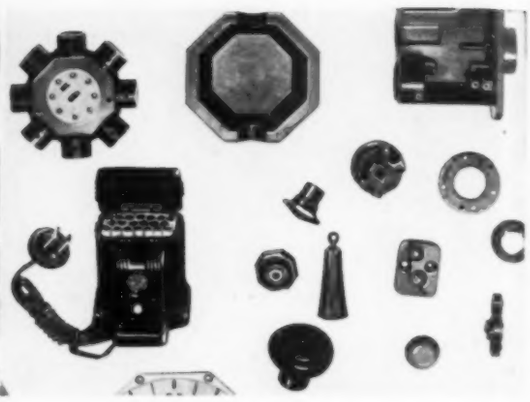
Accepted Applicants in Controlled Circulation Audit Bureau

Published the 5th of each month by Breskin & Charlton Publishing Corporation. Publication office at 20th & Northampton Sts., Easton, Pa. Advertising, editorial and general offices at 425 Fourth Ave., New York, N. Y. Telephone Ashland 4-0655. Western office, 221 N. La Salle St., Room 620, Chicago, Ill. Telephone Randolph 6336. Entered as second class matter September 21, 1934, at the Post Office at Easton, Pa., under the Act of March 3, 1879. Subscription $5.00 per year. Foreign and Canadian postage $1.00 a year extra. Copyright 1935 by Breskin & Charlton Publishing Corporation. Published in U. S. A. All rights reserved. Price this issue, 50¢ per copy.





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JUNE 1935

VOL. 12 No. 10

MODERN PLASTICS

BRESKIN AND CHARLTON PUBLISHING CORP.

RALPH WALKER VERSUS LIMITATIONS

by Dock Curtis

Designer of One Wall Street—Chairman of Sub-Committee on Building and Zoning—Member of Advisory Committee, New York City Housing—and Member of Mayor's Committee on City Planning, Mr. Walker points the way for plastics to remove limitations imposed by other materials in building design

AS he expresses it, Ralph Walker is interested in synthetic resins as building materials because they offer opportunities for "playfulness." While he is one of the most imaginative contemporary designers, he is also one of the most practical, and it is of interest that he regards plastics as one of four groups of materials which will eventually develop a market in mass housing. The other three groups are those of plywood constructed with synthetic resin binders, asbestos materials such as transite, and plaster products such as sheetrock.

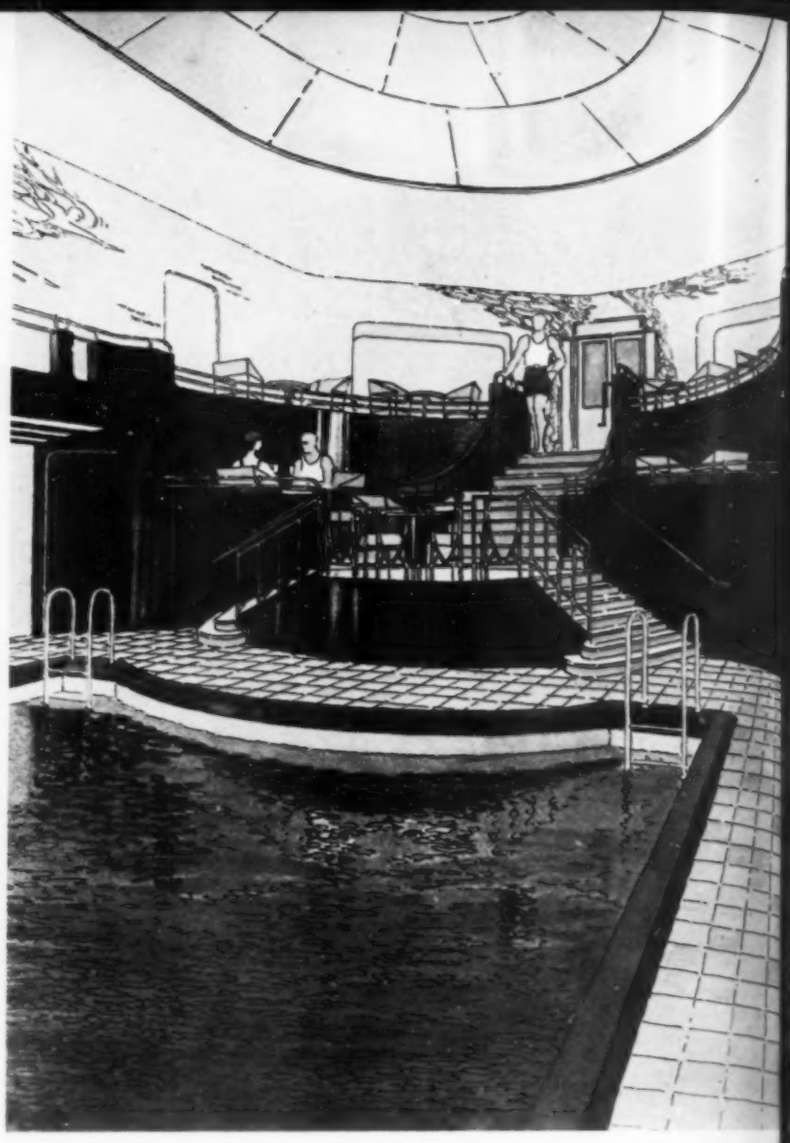
Ralph Walker, of the firm of Voorhees, Gmelin and Walker, is best known for his work on Number One Wall Street, various Telephone buildings in New York, New Jersey and Connecticut, and various Salvation Army buildings. As they evidence, and as he admits, he likes to play—with broad ranges of form, color and line. It is his well considered intention to achieve an organic rhythm in design, and his work is distinguished by its dynamic vigor. Vigor—not only because Mr. Walker is himself a person of abundant vitality, but because he is insistent that the design of a building must be the dog, and the tail it wags must be the material. He is constantly at war with limitations. He is stubborn as a Scotsman can be on the point that mechanical means must be found to realize design, that is, "the idea form that desire takes"—that "means must follow desire"—that "a machine is a power tool directed by design influence"—that "a building is a machine"—"as machines become more

Ralph Walker

fully automatic more minds are released for design functions and the creative impulse thus made independent from manual execution."

So Mr. Walker, having conceived a design in terms of form, color and

texture, wants to execute the design in materials whose inherent qualities are such that the conception is realized without compromise. If an idea cannot be executed in existing materials, he wants a new material. If he likes the color of one and the texture of another, he wants a third material created which shall have both. Needless to say, he is almost constantly in battle. Perhaps the happiest solution to his credit was the reception room in Number One Wall Street. If ever a room has expressed an idea so clearly, as a unit composed of logical parts, that one was completely unaware of the parts themselves, it was so in that room. Four walls, a ceiling, floor, structural columns and decorative details were so organized in Mr. Walker's design that one did not realize where one element ended and another began. It really was an amazing conquest of limits and limitations. (NOTE: the function of the room has been changed and the room temporarily altered, so it cannot be fairly judged at present.)



● Sketch of design for swimming pool of transatlantic steamer. It was planned to use green plastics for walls around stairs and for the pool itself, and blue and white plastics for the outer walls, with mural decoration incised

● Architect's study, designed by Ralph Walker for 1929 Exhibition of Contemporary Industrial Art at the Metropolitan Museum of Art. The same design could be developed with wood panels which have been impregnated with synthetic resin and thus rendered more durable and fireproof; ceiling ornament of bakelite mosaic and border; with cast resin in place of glass in corner cases; draughting table and tabourets developed from laminated wood veneers around bakelite core; and lighting fixture developed with cast resin and metal

This discussion is more than a description of Mr. Walker's point of view in regard to design; it is the reason why, despite present disadvantages, he is confident of the future of synthetic plastics. For they do remove limitations—or promise to—as regards form and color, and they do offer certain specific virtues as building materials—the qualities of resisting fire, water, chemical action; the possibility of lending these qualities to wood veneers, fabric, etc.

In connection with the recent consideration given to improved appearance and increased safety in transatlantic liners, Mr. Walker is among those who worked out designs—one for a large dining room another for the swimming pool. In the latter scheme it was his intention to use synthetic plastics for walls, and probably for the pool itself. The sides and floor of the pool were to be green made more brilliant by concealed illumination; the wall at the deep end of the pool would be a decoration carrying the color from green through blue to white; the walls around the pool, and the stairs leading to the gallery, would be decorated similarly to the big wall at the deep end of the pool. The problems involved here were chiefly a matter of color, and there is little reason, other than possibly

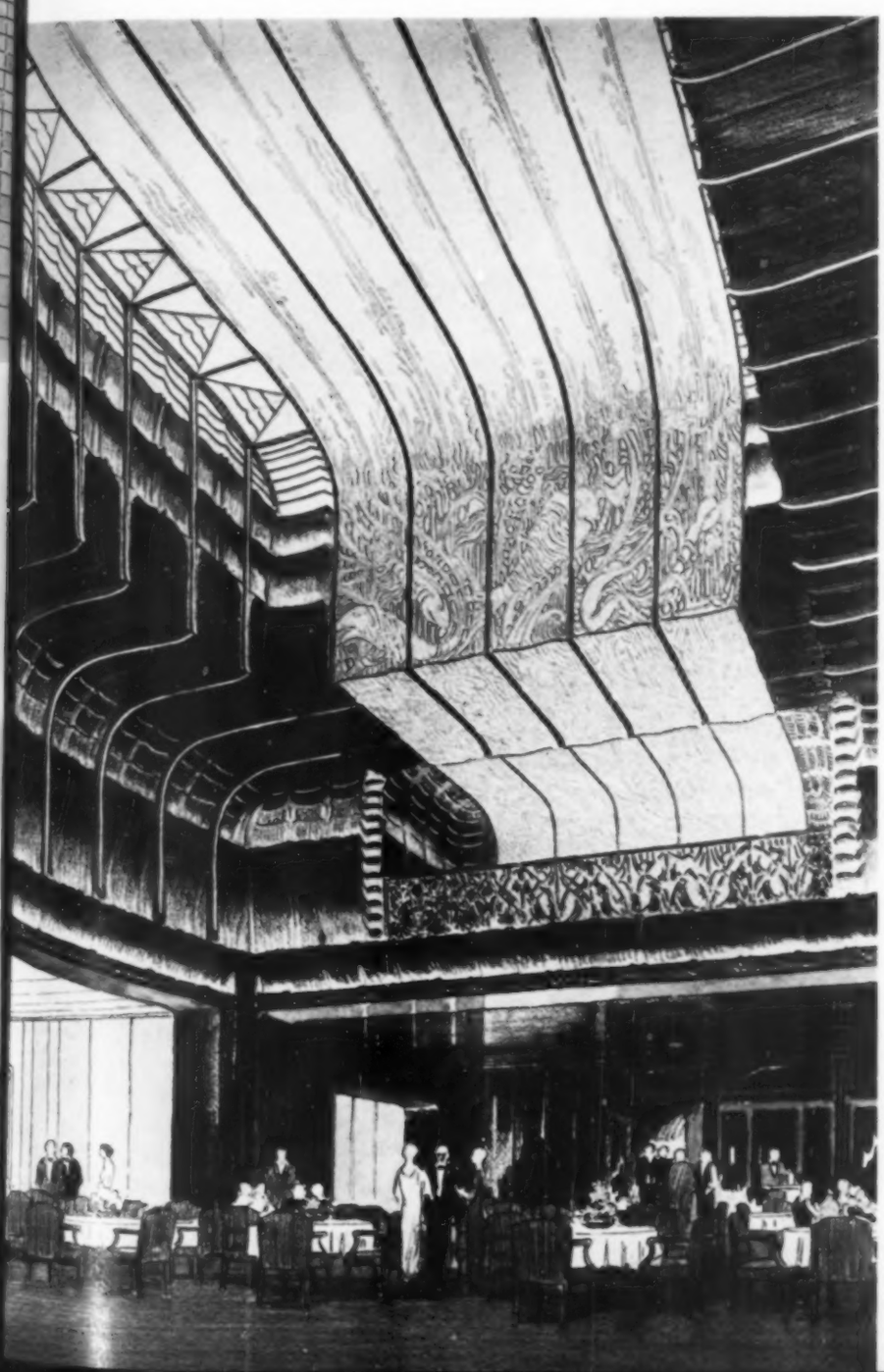
the cost involved, why synthetic plastics in the form in which they are now available, should not be used.

The scheme for the dining room is a somewhat different story, but presents an interesting challenge to the synthetic plastics industry. From the standpoint of Mr. Walker's design, there is no reason why they should not be used. Manufacturing problems, however, would have to be solved. Size and shape of units available should be definitely indicated and satisfactory means of installation clearly demonstrated.

It will be observed by those not already familiar with the fact, that Mr. Walker's approach to design is decidedly not that of the present Internationalist or purist group of architects. As he puts it, "The human mind as it is part of a civilized community is not interested in stark simplicity. The time is one of movement and cannot be expressed in plane geometry, by slab sided cubes or pyramids—static by nature—restless because of their inert qualities." The connotation to the manufacturers of synthetic resins being that the decorative possibilities of their products are worth developing. Smooth glass-like surfaces alone are not enough.

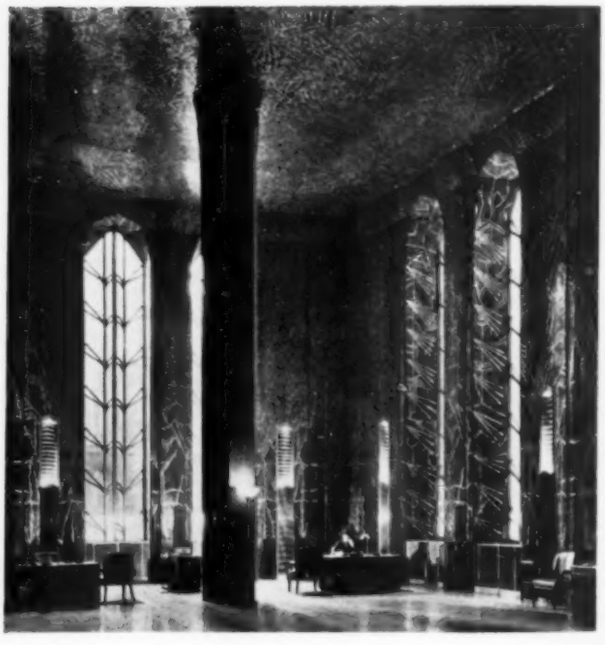
In this connection, Mr. Walker has an interesting opinion to add to the controversy over the legitimacy of imitations of other materials—wood, marble, etc. While he deplores as much as anyone the reverse reasoning that leads to substitution of one material for another, structurally and intrinsically different, in an attempt to suggest greater costliness, or mass or age or other equally spurious effects, and while he agrees wholeheartedly that there are terrible results achieved in some of these efforts of imitation, he contends that the basic fault lies in the intention to substitute unlike materials for each other, and the clumsiness with which it is usually done.

Mr. Walker makes a more specific distinction. If what a designer wants is the pattern and color of a particular marble, and there are structural, expense or other reasons for not using the marble, he sees no reason why he should not use a material which affords, as do some laminated materials through photographic reproduction, not an imitation of, but the identical pattern of the marble. If, however, the intention of the substitution is to simulate structural qualities which cannot be reproduced in another material, then he feels that it is as dishonest or, shall we say, as illogical a process as using columns in apparent support of a cornice which is not a structural member but one which has been applied to steel construction—as a decoration. Again—the decorative use of the form of the column, without making the



● Sketch of design for dining room of transatlantic steamer. Could molded or laminated units be developed in red earth tones for the execution of these walls? Could cast resin sheets be developed and decoration incised for the lighting unit across the ceiling?

● Budget bedroom designed by Ralph Walker for 1934 Exhibition of Contemporary Industrial Art at the Metropolitan Museum of Art. This is indicative of the potential market existing for partitions, doors, hardware, furniture and decorative accessories in the budget housing now being developed. In this instance transite walls were used



Reception Room designed by Ralph Walker for Irving Trust Co., at One Wall Street—an example of the imaginative use of materials to defeat limitations. Floor and wainscot are red marble; walls, ceiling and upper part of columns are mosaic grading from red to gold with no sense of awareness of the change

structural implication, would be a different story.

While Mr. Walker regards it as unfortunate that, until now, most architectural use of synthetic plastics has been based on such pretense, he does not feel that this automatically disbars them from a happier use and development. A garish movie house looks garish less because cheap substitute materials are used than because they are used unintelligently. Likewise the most beautiful and expensive materials available might be used, and the result still be garish. Often it is. Distinction is a matter of design and design implies a sensitive understanding of the specific qualities of materials, both structural and decorative. It follows that distinguished work can be done with materials of the potentialities of synthetic plastics, by a skillful designer who can take full advantage of their intrinsic qualities as opposed to their imitative ones.

Mr. Walker's attitude toward synthetic plastics is doubly interesting because his activity as a designer includes furniture, textiles, wall papers, and other decorative adjuncts to the architecture of his rooms. His rooms in the Metropolitan Museum of Art in the Industrial Art Exhibitions of 1929 and 1935 are doubtless well known. That of 1929 was a luxury edition, built around his very acute personal sense of comfort—physical and spiritual. That of 1935 was a budget edition for the typical housing development also built around the same acute sense of comfort. Hence it is interesting to consider the possible uses of synthetic plastics to achieve an agreeable state of being in (1) a room where money was a relatively minor factor and (2) a room where money was a vital factor.

One of the acute minor irritations Mr. Walker has suffered in his experiences with furniture design for large scale production is the matter of drawers. Why, he asks in some exasperation, cannot he have all the drawers he wants? Why do they have to be constructed of five separate pieces dovetailed together? Why can't they have rounded corners? And then he wonders just why the synthetic plastics industry might not do something about molded drawers—or molded drawer units—so that a marketable product can emerge with an elastic number of drawers that can't stick or assault their user.

When it comes to accessories—lamps, toilet articles, jewelry, etc., Mr. Walker is enthusiastic over the possibilities of cast resins. And again, as in his discussion of marble finishes for laminated plastics, he feels that the development of the cheap novelty market in no way proves that the material is limited to it, that it does not have intrinsic properties suiting it to articles of fine design and workmanship selling at higher prices. Catalin jewelry points (*Continued on page 63*)

Laminated Ureas for the building industry

by George J. Crosman, Jr.
BEETLEWARE DIVISION, AMERICAN CYANAMID COMPANY

This article by Mr. Crosman was presented at the 89th Meeting of the American Chemical Society before the Division of Industrial and Engineering Chemistry at the Hotel Pennsylvania, New York, on April 23, 1935. Photographs are from Westinghouse Electric and Manufacturing Company of Pittsburgh

THE coming of urea plastics with whites and pastel colors in the molding field produced prompt curiosity as to the availability of these resins in the laminating industry. It was seen at the start that the way had probably been opened for the making of laminated sheets for architectural and other uses in the corresponding new range of colors. The ability to get clear lustrous whites and an unlimited range of light colors was the major attraction, but it was also welcome news that these new resins would not darken on continued exposure to sunlight.

Light tan and green paneling in bath in the home of Mr. A. W. Robertson, Westinghouse executive, at Ventnor, New Jersey, showing the new beauty and serviceability laminated plastics provide for baths and kitchens in private homes

The Westinghouse Company, at their Pittsburgh plant, took urea syrup and wrought a series of miracles with it, producing 96 inch sheets in a wide variety of attractive colors and decorative effects. Hundreds of installations have been made as wainscoting, store fronts, paneling in restaurants, cocktail bars and similar jobs of renovation and new construction.

A multitude of minor difficulties have been conquered relative to the technique of manufacture and installation, and the process is a complicated technical achievement, with no compromise being made as to quality. It consists of impregnating cloth or paper with resin solution and then curing under heat and pressure.

Chemically, the resin is a urea formaldehyde condensation product. The resin is formed by a condensation reaction and the molecular ratio of urea formaldehyde is closely controlled, together with solids, viscosity, gravity and pH. The resin solution or syrup is water soluble, clear and colorless.

The impregnating operation is accomplished in specially designed machines, having dip pans and a series of rolls which permit the paper or cloth to be immersed in the syrup in continuous operation from whence it enters an oven where the volatile matter is dissipated. In this operation the material is controlled as to resin

and volatile retention, these factors largely governing the final properties of the sheet. High volatile, while an aid to flow, frequently results in impaired moisture resistance and other physical properties and is accordingly controlled to as low limit as is consistent with good flow. At the delivery end of the oven the impregnated material is wound up on rolls and is ready for immediate pressing or storage. In this form the resin is said to be in "B" stage, being still fusible and soluble.

Suitable sized sheets are cut from the rolls and assembled between polished stainless steel or chromium plated press plates which impart the finish to the plastic surface. The assembly is placed in a multiple opening hydraulic press where several sheets may be imposed in a single opening, a fully loaded press containing between 30 to 50 sheets. A pressure of 1000 lbs. or more per square inch is applied and platens heated to about 125° C. The cure or polymerization then occurs and time is carefully plotted to obtain optimum conditions. During the cure the resin first becomes plastic, flows slightly and then hardens to an infusible, insoluble mass, or "C" stage.

Urea laminated may be made either opaque or translucent by addition or omission of pigments, the former being used for decorative applications in paneling and veneering, and the latter for illuminating purposes because of its fine light diffusing and transmitting characteristics.

Physically, both the translucent and opaque materials possess a variety of desirable properties and lend themselves particularly well to the modern trend of lighting and architectural design. Urea laminated is exceptionally strong and light in weight, a panel measuring 4 ft. x 8 ft. weighing only 14 lbs. It is resistant to sun, water, dilute acids and alkaline; it is highly resis-

This bathroom on the S.S. Queen of Bermuda, in de luxe suites, shows a very practical application of laminated plastics. The walls are Bianto Chiaro contrasted with verd-antique. Ideal for liners and marine service because of its light weight and fire resistance

In hospitals especially, this material is well suited because of its sanitary surface and its resistance to chemicals. Installation illustrated is of straw color paneling with black trim

Offices are greatly improved with working surfaces of laminated for partitions and wainscoting. Below at left is Mr. Renken's private office in the M. H. Renken Dairy, Brooklyn, N. Y., done in straw and light brown

Light green and beach sand were the colors chosen for paneling in Beetleware permanent exhibit 57th floor, Radio City, New York shown at right, below

Store fronts are easily and economically renovated and made modern with laminated ureas. Thompson's Restaurant, Columbus Circle, New York, is in light blue and has withstood the rigors of exposure to the elements, showing little deterioration over a period of years

tant to surface abrasion, heat and boasts good insulation properties, and will not support termites or fungi growth when installed.

Made in large size sheets it may be sheared, sawn or drilled and ease of fabrication and installation is one of its principal advantages. For prefabrication laminated affords intricate shapes and forms requiring only erection on the job. Supplied in standard size sheets, it requires only a carpenter's skill to saw, plane, fit and erect, eliminating the costly fabrication necessary for marble, tile and glass.

Its physical properties and ease of fabrication and erection combine to adapt this material to a wide variety of applications. In service in numerous installations as restaurant table tops, bars and cocktail tables, this material has withstood hard usage and continual washing with strong alkalis.

A recent development of urea laminated is its application to bonded metal. Work on this problem was done by the Mellon Institute and the product is manufactured by the Mica Insulator Company and is named "Lamicoid."

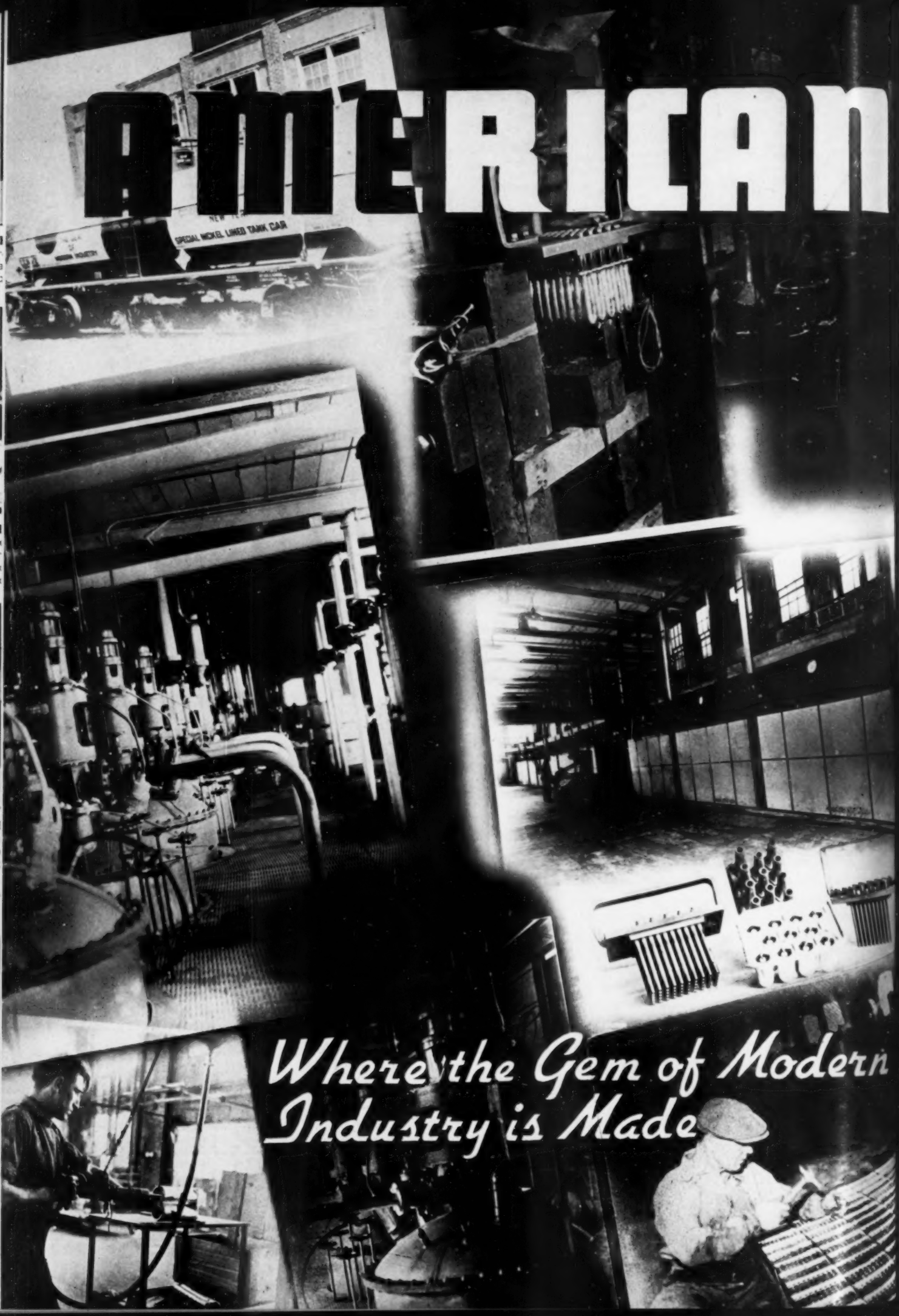
Thin impregnated sheets of urea are laminated to the surface of bonded metal in the conventional laminating process. Its introduction widens the scope of laminated applications hitherto impractical. It is particularly suited to elevator cab lining, air conditioning cabinet construction, toilet partitions and many other uses where totally fireproof materials are necessary. It is available in the same fine range of colors and decorative effects as the all-laminated sheet.

Translucent laminated is produced in thin flexible sheets in a variety of colors. Because of its light weight it will be readily seen that this material would be of interest to replace heavy and breakable glass for numerous lighting applications. Very pleasing in light diffusion and efficient in light transmission, this material appears destined to meet a need long felt in the lighting industry.

Unaffected by vibration and shock, it is admirably suited to marine service and transport lighting—buses, railway and street cars employ this material in direct and indirect lighting effects.

It answers the problem (*Continued on page 61*)

AMERICAN



Where the Gem of Modern Industry is Made

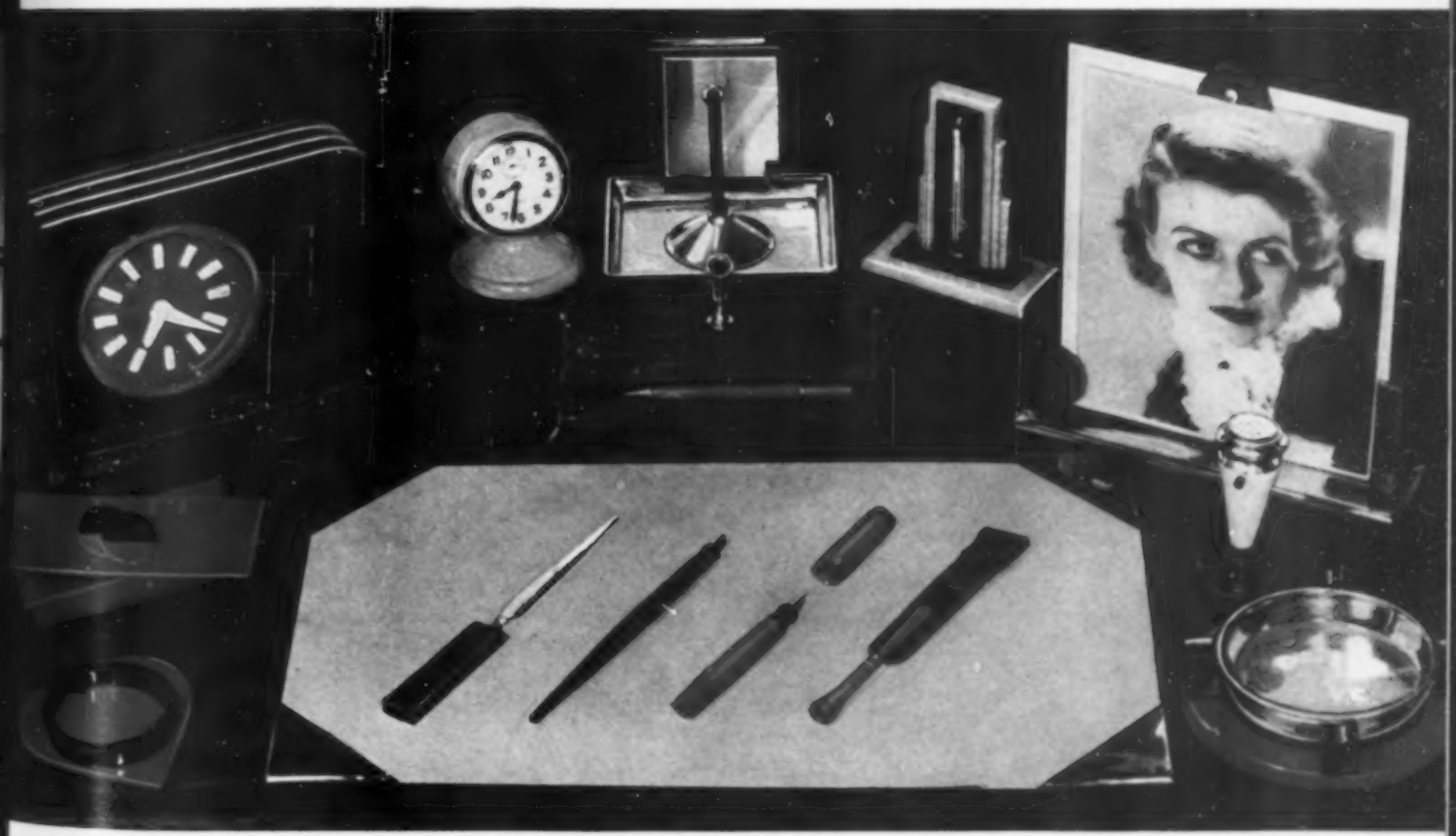
CATALIN

by Ruth Lampland

The story of the birth and development of cast resins—the precious gem's only rival—has been pioneered in this country by the American Catalin Corporation, makers of Catalin and Prystal, whose courtesy made these illustrations available. Direct color photographs by Julius Hoffman.

IN less than seven years cast phenolic resins have come out of the laboratory into the hands of nearly every person in the United States.

Seven out of every ten women who wear costume jewelry purchased this season will be wearing jewelry of cast resins. About five out of every ten picnickers whose knives and forks have gaily colored handles will be using cast resin to hold them. At least three out of every ten automobilists who crowd the highways on a Sunday afternoon will have on their cars at least one accessory—a gear shift knob, a dashboard cigarette lighter, a fender guide, or perhaps a special radiator cap—made partially or entirely of cast resins. The people using this material, however, do not know it by the name of cast resins. To them, in most cases, it is Catalin, or Prystal, or whatever name their own imagination has placed upon the material.



Courtesy of the American Catalin Corporation, New York

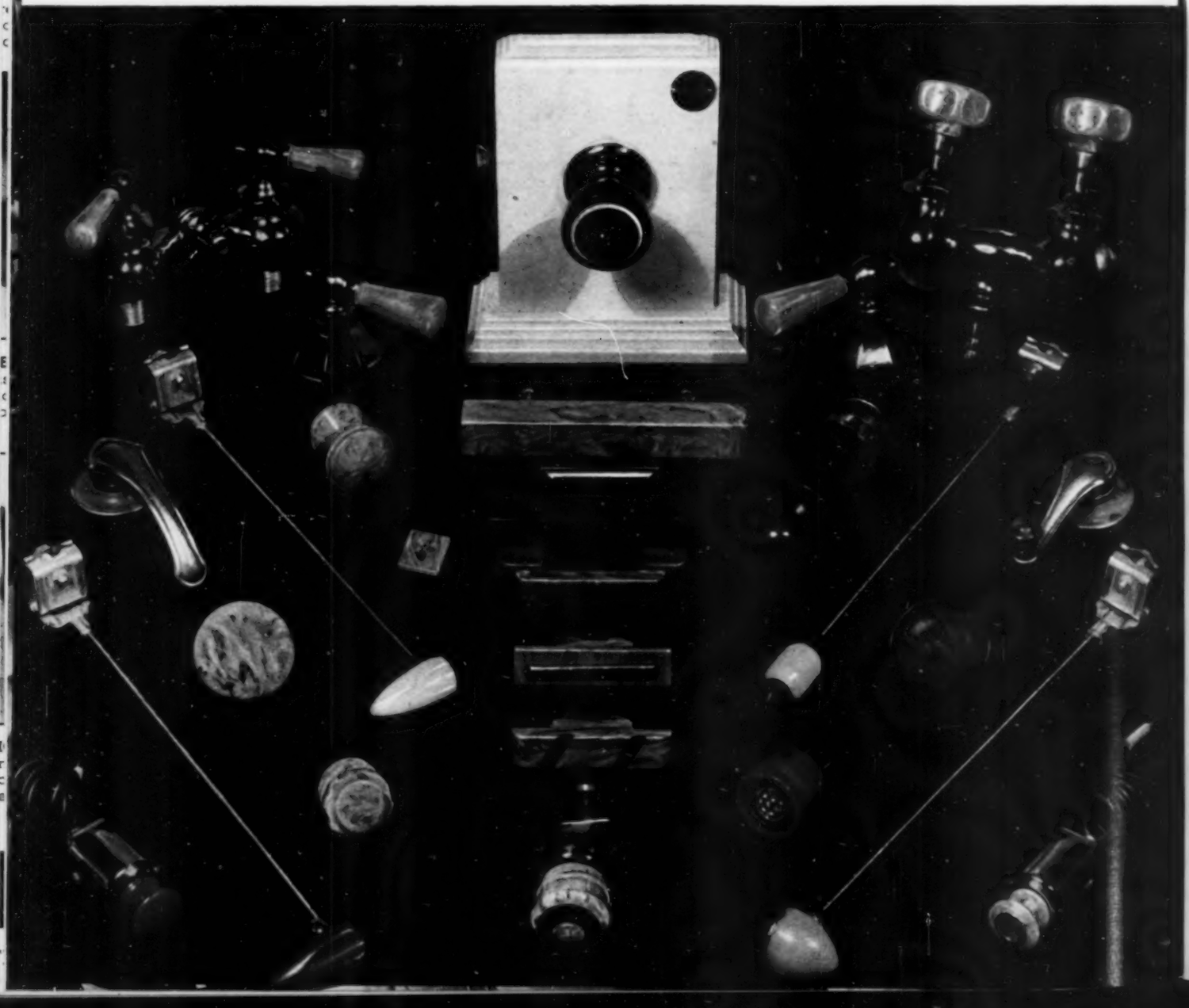
Catalin, which is a perfected cast resin product, offers a new material to a modern world. The generic term "cast resin" is far from a suitable description of the genuine beauty of a vast range of delightful objects that are made from it, and the American Catalin Corporation has made rather rapid strides in presenting and promoting its materials—Catalin and Prystal—by their individual names.

The story of this remarkable development—this consumer acceptance of an entirely new type of product—is the story of a product which succeeded because it met a great composite need.

Nine years ago, when the American Catalin Corporation purchased the secret processes and manufacturing rights for America of Herolith from Herold A.-G., a German firm, and in 1932 when they purchased the cast resin patents of Dr. Fritz Pollak, Austrian chemical wizard, and his associates, for thermo-setting phenol resins, there was only one place in the United States where cast resins were known. That was in the laboratories of Dr. Leo Baekeland, inventor of Bakelite and work in these laboratories was then being concentrated upon Bakelite. So it was left to the American Catalin Corporation, with its vision of the place cast resins could fill in American industry, to initiate their development and introduction in this country. The first plant was put up in 1927 at College Point, Long Island. Later on in 1930, they built a large and what is conceded to be the most modern plant of its kind, in Fords, New Jersey. They applied for American patents on the secret processes they had purchased abroad, and later on purchased all of the American patents formerly held by Pollopas Limited of London. Then they started selling and manufacturing Catalin in volume.

Early in 1935 the Corporation purchased from the Societé Nobel Française the trade name and manufacturing rights under their American patents formerly made by them and known as Prystal. The original material manufactured by Nobel Française and sold under the name Prystal was a urea product of a water-clear nature. This type of material was not only subject to limitations in application, but the most serious

Courtesy of the American Catalin Corporation, New York



Courtesy of the American Catalin Corporation, New York

objection was its susceptibility to cracking and distortion under varying changes in temperature and atmospheric conditions.

Prystal, as now made by Catalin is a cast phenolic resin having the same clarity and beauty as the former French Prystal.

In the beginning it was difficult to sell the new material. It was completely unknown. Manufacturers had no idea how to apply it to their advantage. They could see the beauty of the transparent, opaque, and mottled types of cast resins, but they could not at first visualize their fabricating process. Yet there existed a great need for this type of product. Jewelers, manufacturers of beautiful things for interior architecture and decoration, and innumerable manufacturers of novelties had wished for a less expensive domestic material to replace the imported precious and semi-precious stones, ivory, crystal, and other materials which were so costly to make into consumer goods that their public was relatively small.

Therefore, when Catalin appeared, manufacturers had only to be shown how to make use of them and to have their possibilities and limitations pointed out, to become enthusiastic about this new material.

Cast resins, by their very nature, are admirably suited to novel and decorative use. The basic liquid material (composed of phenol, formaldehyde, a catalyst to hasten their hardening, and whatever dyes or pigments are needed) is thermo-setting, and requires only simple arbors to shape it. Since no expensive molds are required, its cost is comparatively low. Because it is actually a transparent substance, it can take dyes of almost any color. Because it hardens under atmospheric pressure only, it can be formed in sheets or poured over other materials like wood, and need not be pressed into shape. And because it is easily workable like wood, it can be given a multitude of decorative forms. Best of all, it is domestic and carries no duty; and it cures in a week to ten days, making delivery possible in a comparatively short time after an order is placed.

The need for this type of material, which existed then, has grown into a substantial demand. It will probably continue to grow as long as our civilization dictates that we dress according to an ever-changing and rainbow-colored fashion, and as long as our rising standard of living leads us to require more beauty in the objects we use in daily life. We have been taught to appreciate and expect more beautiful places in which to work as well as those devoted to our recreation.

The demand for jewelry which was both good-looking and inexpensive increased during the years in which the public counted its dollars more carefully. Through the lean years, the market for imitation jewels became greater and greater. Glass and "paste" were obvious and failed to satisfy the market. But Catalin and Prystal possess beauty in their own right. Their popularity is legend, and all sorts of costume jewelry

Courtesy of the American Catalin Corporation, New York

and decorative ornaments have become established merchandise in the better stores.

John Wanamaker, for instance, recently ran the following advertisement:

> "Color Injection in New Catalin Crystal Jewelry! Bracelets—Earrings—Clips—Pins—Pairs of Clips.
>
> "The color literally is injected. The crystal-clear jewelry is drilled, and the holes filled with gay Spring colors...yellow...green...blue...red giving the effect of coral seen from a glass bottom boat!"

What types of merchandise most readily adapt themselves to the use of cast resins? There are several. Some fields have used them extensively, while others are just beginning to appreciate the tremendous possibilities offered by this easily fabricated synthetic product.

Costume jewelry, for instance, has so definitely taken cast resins to heart that a recent estimate by a fashion authority quoted the percentage used in all summer jewelry this year at 70%, and in all winter jewelry last season, about 30%. The use of cast resins for earrings, clips, pins, bracelets, necklaces, and other items of personal adornment is now so widespread that it would seem that a point near saturation had been reached. Undoubtedly, however, manufacturers will continue to increase the variety of applications and the volume of material used in this direction will probably increase.

Buttons, belt buckles, slides, and other dress accessories, a field closely related to that of costume jewelry, offer a constant demand for new colors, carvings, cut-

tings, shapes, and types of material, but probably will not offer any great increase in production because they already consume a considerable portion of the total volume of material made. Buttons and like shapes are readily machined from Catalin.

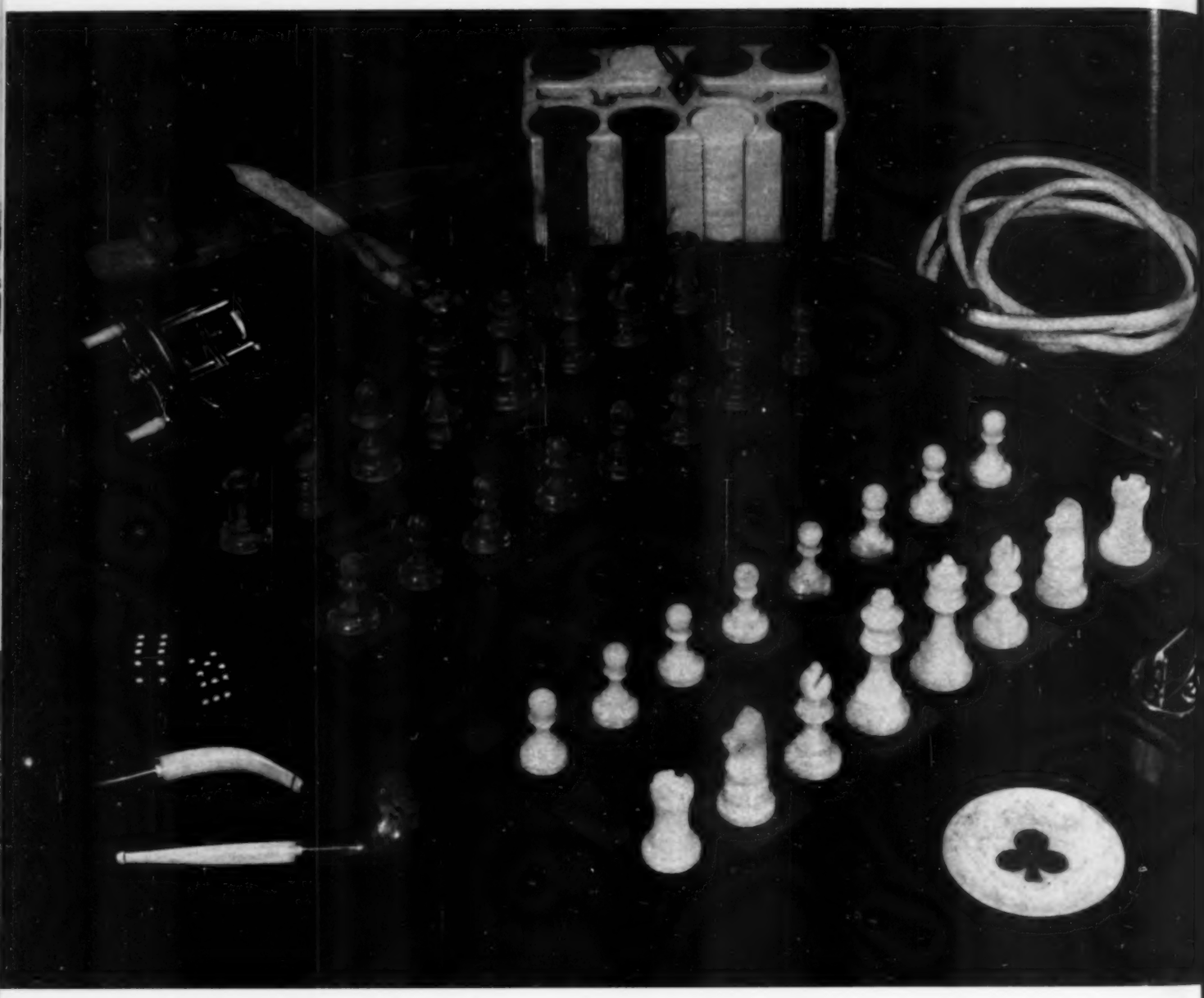
This steady market—steady as long as women continue to follow fashion—is one cast resins can and will hold because they can be so nicely combined with other materials as well as used alone. And their broad range of attractive colorings preclude them from going out of style as would a less versatile material.

The demands of fashion can be readily met with color as well as form and it is not altogether impossible that new adaptations within the dictates of fashion will actually increase the demand and volume.

Another field wide open to their development is general hardware. Handles for knives and forks, for kettles, pots and pans, where a non-heat-conducting material can best be used for comfortable handling and lasting life. Catalin has long been used in this field. Handles for drawers and for doors can be made of no better material and their general use would constitute a steady market. These items are necessities and with the present vogue for color in home decoration this market shows illimitable possibility for growth. Attention is being given by manufacturers to strengthen their material and standardize their colors to immediate decorative demands.

In the field of decorative accessories—gifts, premiums, and home accessories, there is perhaps the greatest opportunity, outside the building and button fields, for rapid growth. This field is one in which much has already been done. In spite of the extensive adaptation of Catalin to clock frames, lamp bases, picture frames, desk accessories, and innumerable small objects from fountain pen stands to cigarette lighters, ash trays, and handles on trays for serving, there are many items in a household, in an office, hotel, or

Courtesy of the American Catalin Corporation, New York



Courtesy of the American Catalin Corporation, New York

club, which can be made more beautiful through the application of cast resins, either as decorative material or as the basic material ornamented with metal.

Displays and exhibits are a fourth grand field already served by cast resins in a limited way. Display signs, particularly those with indirect lighting, offer a market for signally clear and brilliant faces for their neon-channel lights. These faces can best be supplied by the opaque cast resin, which allows light to travel through it rapidly and well, but does not overheat as would glass. The Catalin Corporation has pioneered this field to the development of extremely practical examples of installation. Catalin, being hard and shock-resisting as well as translucent and permanently colored, gives protection to Neon lighting in signs and removes all limitation of lettering styles by offering a continuous or broken line of light as may be desired. Counter displays for department stores, drug stores, specialty shops and for organization headquarters, are now being made of this practical material in an altogether too limited extent. At the moment, one of the most popular cast resins is the crystal-clear Prystal. Next in importance come the great variety of colors and veinings which probably will be used in displays as they are now used in other objects to gain brilliant decorative effects.

The display field is one of several which will offer much greater opportunities for volume in the cast resin industry than ever has been offered before. So far, little use has been made of cast resins in large panels three by six feet, or in long tubes twelve to fourteen inches long, or, for that matter, in blocks of any size. That means, that in spite of a tremendous geographic coverage achieved by the material and in spite of the great number of objects made partially or entirely from it, the volume still has not been as great as it is des-

tined to be when fabricators realize its full scope.

However, with the increasing use of cast resins for larger objects, the volume produced for manufacturing consumer products as well as for architectural purposes will mean a growth of prosperity for the whole industry. A rapid growth of prosperity for those firms best equipped to handle this new type of demand and with initiative to go after the business will naturally follow.

What are these additional large-volume fields which offer so great a challenge to the whole industry? Lighting fixtures is one. Pendant fixtures and large and small chandeliers have been made of mottled Catalin with parts joined by elaborately scrolled sections of silver- or gold-plated metal. Smaller fixtures have been made of similar materials. Table lamp bases of clear Prystal have been featured by smart shops because of their intrinsic beauty and adaptability to the severe geometric lines of modern design.

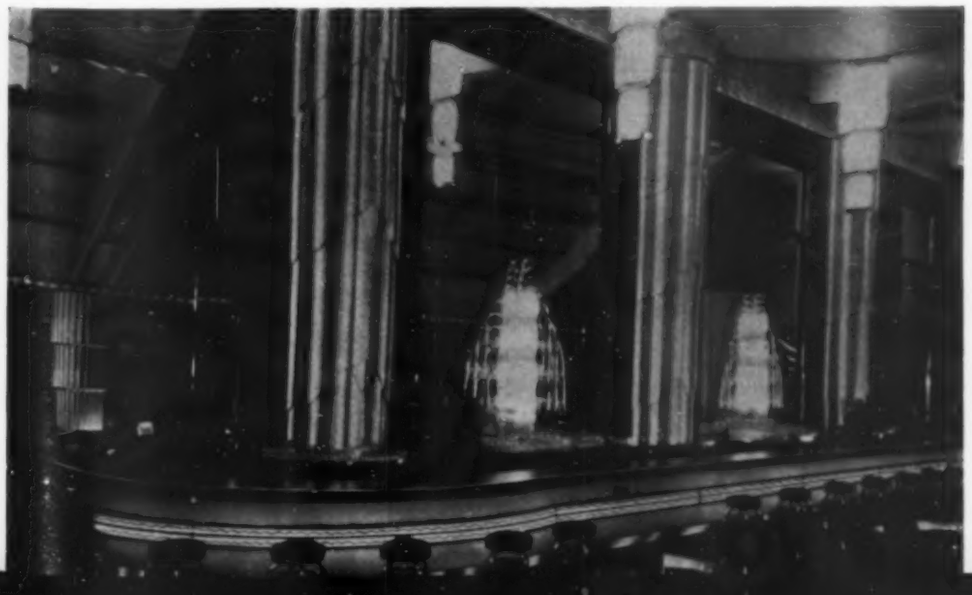
Lighting fixtures for public buildings, theatres, offices, clubs, and for homes and apartments, are now being made of Catalin. The long tubes, in which synthetic resin is cast, form ideal geometric light shades to be used either as half-cylinders partially shielding the panel of lights beneath, or as full cylinders within which a panel of light bulbs may be placed. The French Casino in New York, with its long Catalin tube lights, has already set the fashion in this direction for other theaters and night clubs. Large flat square plates of cast resins may form the sides for other lighting fixtures. They are found invaluable in the creation of indirect lighting effects where a soft diffused light spread over a large area of the wall or ceiling is preferred to a bright spot of light illuminating only a small area with resulting black shadows about the room.

Closely allied to the field of lighting fixtures is the unlimited field of architecture. Here the opportunities for the use of cast resins as wall panels, inserts in door frames, decorative escutcheon plates for door knobs and lighting switches are just beginning to be realized. A number of different applications for each room in a home are suggested when one ponders the subject even briefly. Striking and dignified uses of cast resins for the ornamentation of lobbies in office buildings, receptions rooms, for furniture designed to match an interior, have only to be designed to demonstrate their superior qualities. The success of cast resins in the field of architecture—particularly interior architecture—is limited only by the skill, good taste, and inventive genius of the designers entrusted with the tasks wherein cast resins may be taken into consideration.

Similarly, the success of cast resins as parts of furniture will depend upon the good taste of the designers who apply these materials to this purpose. Catalin tops for tables are being used in game rooms, bars, and other festive spots where a more pleasing effect can be gained through gay colors than through dark colors. The fact that cast resins are impervious to cigarette burns and to alcohol and acids assures them of a growing place in the construction of furniture for the modern home. Gradually being introduced for arm rests on chromium rod chairs, cast resins will later be used for trays on tea tables, shelves in cupboards where dishes or bottles are on display, and for an unlimited range of objects now made of glass, wood, marble, and other materials. To match smoking accessories now in common use and to harmonize with book ends and lamps, any number of new furniture adaptations can be made as designers become more familiar with ways to use this material. *Bois glacé*, the transparent Catalin-coated wood which proved such a successful jewelry innovation this last season may well take the place of glass tops for desks, boudoir tables, and dressers. It combines the beauty of wood with the safe and lasting surface of Catalin.

Cast resin coated wood or cast resin impregnated wood may well be used, in small volume at first, but in larger volume later, for games and sporting goods equipment. Cast resin ninepins, golf clubs whose striking center is of cast resinous material inserted between wood and steel, jumping rope handles of cast resins in bright colors, poker chip blocks with innumerable poker chips themselves—these and many other types of game equipment furnish outlets for cast resins where the addition of this durable, strong and waterproof material makes the object more satisfactory to the consumer at small additional cost to the manufacturer and at small enough increase in price to the retailer to be offset in the increased volume of sales.

Closely related to the game field is that of hobbies, America's fad at the moment. Although it is not yet generally known that cast resins are as easy to carve and to manipulate as wood, and as challenging to the skill of the artist, the time is fast coming when the pub-

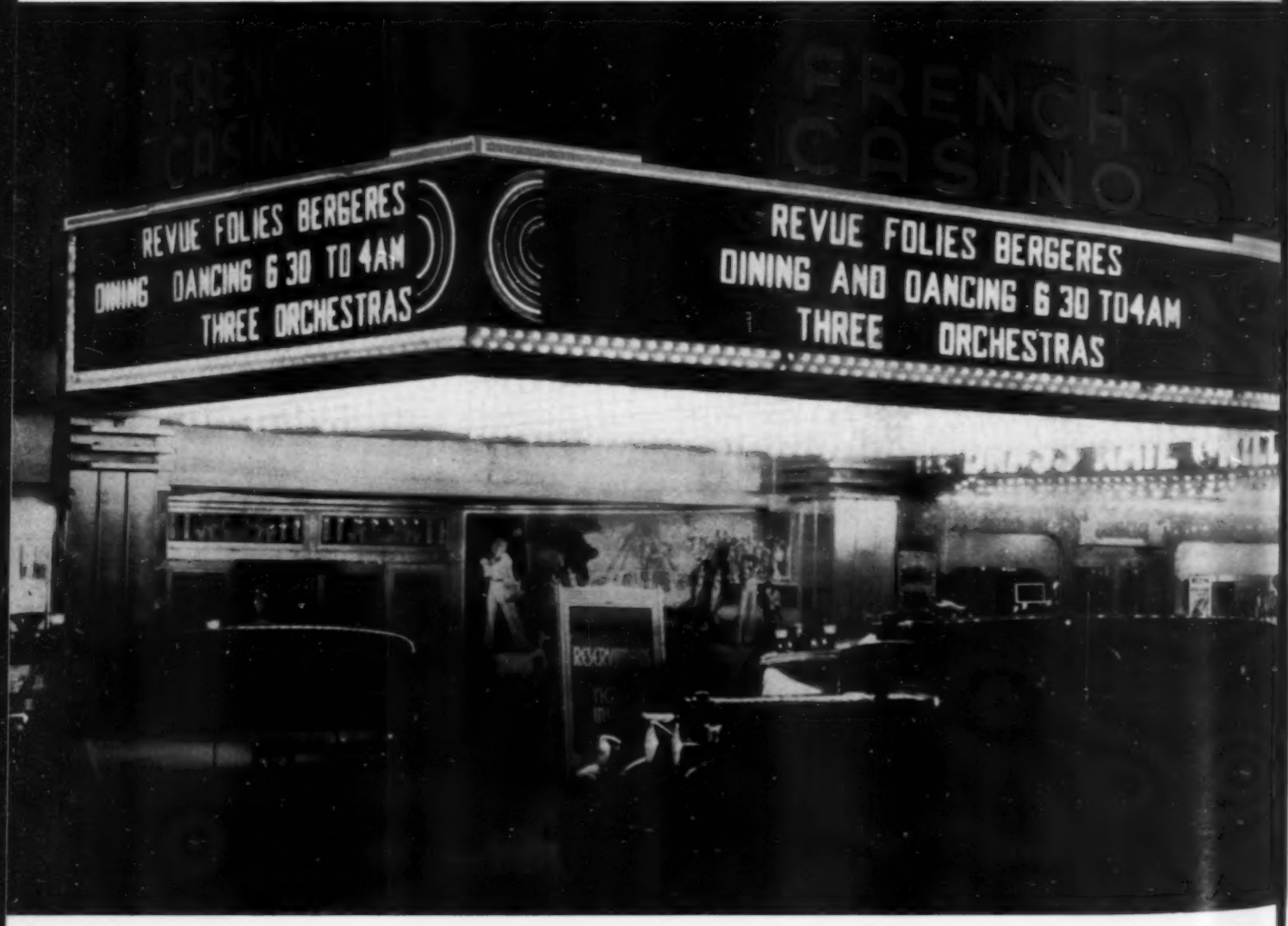


lic will learn of this fact. Then, as volume increases in production of cast resins, and it becomes possible to purchase scraps or even whole blocks, sheets, tubes, or rods for craft purposes, this additional outlet will increase. There seems to me to be no reason why a bust carved from Catalin should not be as beautiful as a similar one done in wood or perhaps marble. There is a vogue afoot for facial masks, to be hung in pairs, trios, or small groups on the walls of smart modern apartments. Such masks can be as skillfully carved from Catalin blocks or sheets of the required thickness as from cork or wood.

There may even come a time when cast resin carving contests can compete with the soap sculpture contests held annually by Ivory, with great profit to the manufacturer. Skilled artists have already carved such intricate subjects as the Lord's Supper, in Catalin. Amateur artists may find this as suitable a medium for their creative talents as amateur etchers find copper. It is all a matter of price and accessibility of the raw material, and of the ability of the manufacturers of this raw material to create and keep up with the demand.

With the growth of art in industry, cast resins have found a very practical use in modern packaging. The material is comparatively undeveloped in this field but cosmetic manufacturers are leading the way. They have combined Catalin with mirrors, making small oblong dresser trays for powder boxes, and small objects of jewelry decorated with simulated wheels of cast resin at the four corners. Bath powders are presented in boxes of the mottled material in pastel shades. They make admirable gift packages. Cigarette boxes available for gift purchases combine spun aluminum with bright-colored bands of cast resins. Such boxes may be given by manufacturers of other products than cigarettes to increase the sale of their goods at Christmas time. Here again, the Catalin Corporation is pioneering the packaging field by taking its story direct to those executives responsible for packaging in corporations making consumer goods. It maintains an experimental fabricating laboratory where any serious problems of any manufacturer will be worked out but in no sense does it enter into the fabrication of its material in competition to fabricators. The laboratory is exclusively experimental and is invaluable to those with a fabricating problem.

The Catalin Corporation is constantly striving to perfect its material, strip it of the misnomer—cast resin—and establish it for what it is—the gem of modern industry.



Mr. Plastics
will soon be known as "BILL"

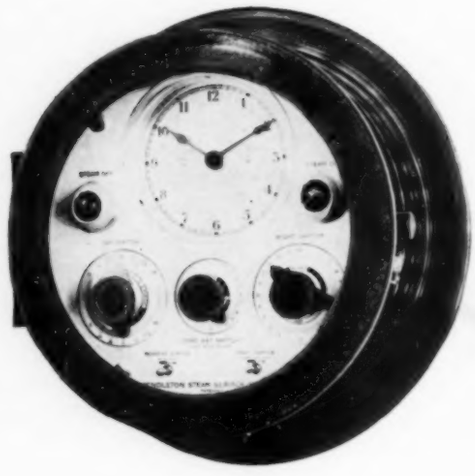
PLASTICS are beginning to get their breaks in the news and it is about time. Nothing in these last ten years has approached the rapid development and progress made within this industry but to the outsider it's still a mystery.

Ask the average citizen what he thinks of plastics and ten to one his reply will be another question—"What are plastics?" After all it's not his fault. He has never been told. Plastics sort of sneaked up on him. First replacing the metal cap which gouged his finger when he removed it from his toothpaste and shaving cream tubes and, thanks to design, and the light weight and low cost of plastics, it is made large enough to permit a good grip and is less apt to roll away. What are they made of? He never gives it a thought. He likes them and that's all. But when he buys new things—new tubes of other products—he looks to see if the new tube has one of those what-do-you-call-it caps. He finds the same material in other convenient places too, his cigarette holder, ash tray, telephone, etc., and more than likely bases his choice between many articles he may purchase on the strength of the friendly feeling he has developed toward his toothpaste and shaving cream closures. Women feel much the same (*Continued on page 59*)

How big is a BIG MOLDING

The answer changes from day to day, as bigger presses and more accurate control permit pioneering work in this direction. Yet, within present day limits, it may safely be said that any molding over ten inches in any one dimension may be classed as large.

Probably as a hang-over from the days when control was less certain, there still exists an impression among the general industrial public, that special difficulties are encountered when large moldings are planned, both in the molding operation and in after-use. A study of the records of such moldings may afford some enlightening information.



THE Pendleton Service Control is a device which automatically regulates the amount of steam supplied to heating systems. A delicate, expensive instrument, it requires a housing that will afford both adequate protection for the parts within and a neat and dignified appearance on the surface.

As originally manufactured, it was housed in a heavy sand cast metal case, with either black, bronze or verd-antique sprayed finish. Frequent cleaning was necessary to maintain appearance and gradual deterioration of the protective and decorative surface occurred as the painted surface became marred or worn. Costs were high because of the labor required in machining and finishing.

Hence the manufacturers turned to a consideration of molding. Their daring, in so doing, may be appreciated by the fact that, in 1931, when the job was first molded, these sections were rated as the largest pieces molded up to that time. Potential difficulties included warping of the circular sections, bellying of the base or back, deviations in the position of metal inserts and possible fracture of the walls at hinge points.

Aware of these possibilities, both molder and client planned a design calculated to avoid such eventualities in so far as possible. Thus the points of contact between the base circle and the cylinder of the case proper were so planned as to require no exact fit. Slight deviations here in no way affect the appearance, serviceability or accuracy of the molding. Similarly, extra strength at the potentially weak hinge between cover and case was secured by using a metal hinge, bolted into position.

In addition to planning for practical design, the molder set up a control system that insured correct cure for each piece—thus eliminating the warping and distortion that might otherwise have been encountered. That such control is extremely important, both in its effect on the finished product and in the lowering of rejects and hence of costs, may be seen by observing the possibilities of warpage in the base section. Here the shrinking of the circular raised ridge would tend to buckle the bottom portion and such buckling would throw the threaded inserts which support the mechanism out of line.

Whereas shrinkage on small pieces will be often so slight as to justify ignoring them entirely, those of larger sections must be carefully anticipated, prior to mold construction, if subsequent molding and assembly troubles are to be avoided. In some cases, it is necessary to so calculate the shrinkages that, after they occur,

you will have a perfect fit between two molded pieces. This is the more costly and difficult method. In other instances, however, it is possible to so design your device that a micrometer-measured fit will not be required. Such was the case in this instance, this type of planning undoubtedly producing a pronounced saving over the more exacting alternative method without, in any way, harming the qualities of the assembled whole.

Remembering that the control is more than thirteen inches in diameter, it will be readily seen that the difference between molding in such large sizes and molding ordinary pieces resolves itself into a problem of establishing greater control over each individual molding operation.

With this control, the Pendleton Associates have experienced a remarkable record for failureless installations. Of the more than a thousand instruments installed, about four hundred of which have the new type molded housing, under every type of operating condition, not a single instance of molding failure has been encountered to date. Costs have been decidedly lower than when metal was used, consumer acceptance of the molded sections have been favorable both because of the elimination of polishing and because of the more durable finish. Easier assembly has been achieved and machining and finishing of the case eliminated.

Today there are a number of other larger moldings in regular service. Yet the Pendleton job, largest in its day, remains an outstanding instance of the practicality of such work under proper conditions of planning and control.

Credit: To the Bakelite Corporation for phenolic molding materials; to Boonton Molding Company for molding.

developments of the MONTH

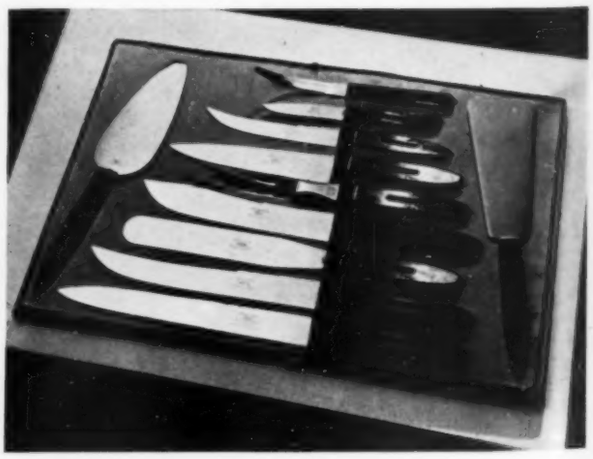
The little transparent funnel shown at the top is molded from Tenite by the Hemco Division of the Bryant Electric Company. The application for this device should be wide and varied.

The Speedmaster Electric Teakettle made by the West Bend Aluminum Co. is more than just another whistling teakettle. Its attachment contacts are molded into the plastic handle which is also equipped with a trigger arrangement which lifts the cover of the spout for pouring. Being Bakelite the handle is always comfortably cool. The teakettle is equipped with an immersion type unit which makes it economical to operate and permits boiling two pints of water with its own heating unit in less than six minutes. A mild whistle tells you when the water boils.

An iron with a new type air-cooled molded handle, a headlight, and a built-in heater indicator has just been announced by the R & R Electric Co. of Mt. Joy, Pa. By means of slots in the handle, a much greater heat radiation is possible, which, coupled with the natural low thermal conductivity of molded Durez, makes for a very cool handle. The switch on the top of the handle is for greater convenience in maintaining proper ironing temperature and the headlight eliminates all shadows from the work.

Quite the neatest gift set of cooking, carving and serving knives, spatulas, and fork is presented by Remington Arms Co. Inc. Stainless steel molded in mottled brown Bakelite handles gives them an air and assurance of permanence. A gray plush fitted easel makes them easy to display.

New synthetic materials overcome the shortcomings that compasses have had for years—a fact demonstrated in this new Leedawl pocket compass just announced by Taylor Instrument Company, Rochester, N. Y. Instead of the old metal case with its chipping and rusting tendency, the new Leedawl has a case molded in one piece of Durez which cannot rust, chip, dent or lose its lustre. It is also made of Plaskon in ivory and other light colors. The dial and other metal fittings are aluminum to prevent rusting and corroding.



DISTINGUISHED SERVICE

The Kaufmann Medal—grand prize of the Industrial Arts Exposition, which held forth in the Forum of Rockefeller Center last month—was awarded to the Western Clock Company for its Westclox purse watch.

Edgar J. Kaufmann, of Pittsburgh, was doner of the prize which according to Ben Nash, Chairman of the Exposition Committee, was given for "that product which, in the opinion of the Award Jury, exhibits in the greatest degree, the merits of beauty, utility and availability."

George Blow, President-Treasurer of De Vaulchier and Blow Inc., Product Designers, cooperating with the Design Division of Western Clock Company, created the Westclox purse watch in the Fall of 1933 and its sales success is a matter of history. The watch is available in blue or white cases of molded Plaskon as well as in black Bakelite and comes packaged with a plated brass stamped easel which holds it upright for easy visibility in its dual capacity as a practical desk or boudoir timepiece.

Time has proved the wisdom of choosing molded plastics for this popular watch which is so constructed that powder or other foreign matter cannot filter through its case to the detriment of its mechanism. Its case is permanent in color and lustre. Even after two years of carrying and continual use it appears to be new.

Another award was made to the Hammond Clock Company for the Hammond Organ (see May issue MODERN PLASTICS, page 25) which has keys and foot pedal controls of molded material. According to popular vote of those who visited the displays, the Hammond Organ proved the most interesting of all exhibits.

The exhibits of those engaged in the plastics industry drew many visitors and offered a splendid opportunity for the general public to become better acquainted with the material from which so many things in everyday use are made.

The Bakelite Corporation (Bakelite), Beetleware Division of American Cyanamid Co. (Beetleware), Fiberloid Corp. (Fiberloid), Marblette Corp. (Marblette), Tennessee Eastman Corp. (Tenite), and the Toledo Synthetic Products, Inc. (Plaskon) exhibited thousands of attractive and novel items molded or fabricated from their materials which gained a wealth of attention and favorable comment.

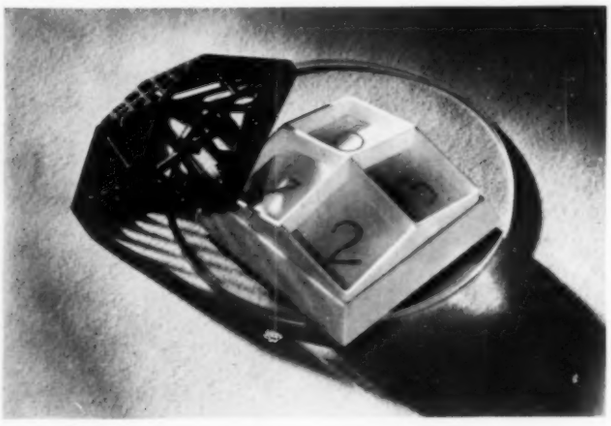
Credits to Bakelite Corporation for Bakelite used in black and brown Keys of the Hammond Organ and the black case of Westclox Purse Watch; Toledo Synthetic Products for Plaskon used in White Keys of the Organ, and the blue and white cases of Westclox Purse Watch; to Chicago Molded Products Co., for molding both the purse watches and organ keys and foot controls.

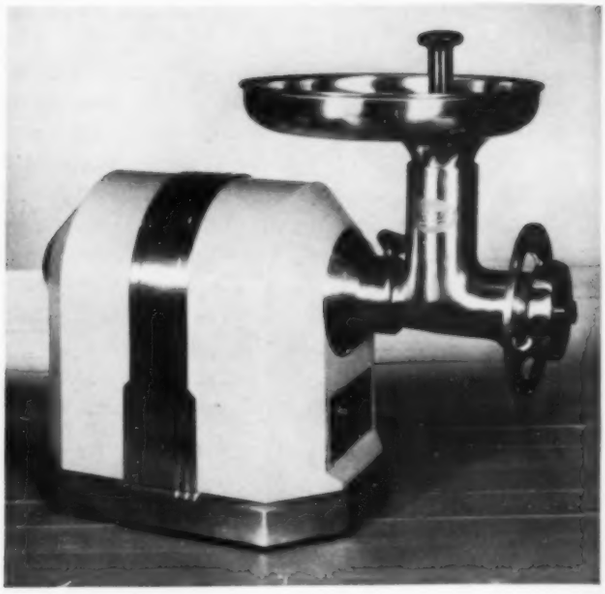
Mrs. Gerard Swope presents the grand award of the Industrial Arts Exhibition to George Blow, designer of the Purse Watch which won the award

PLASKON

HOLDER:

This white Plaskon receptacle (with a black Durez top) has created quite a stir in the dental world. Acid and fire proof, its appearance on the dentist's tray eliminates the problem of keeping a supply of cotton pellets safely within reach; has almost doubled sales for the Richmond Dental Mfg. Company. Dentists have noted too that its good, and obviously sanitary, looks impress gaping patients most favorably. It is made wtih four compartments to hold different sized pellets, is easily sterilized, and readily filled. Molded by Norton Laboratories.





CHOPPER:

The emergence of Plaskon as the colorful modern material for large machine housings occurred some time ago. But rarely does opportunity present such a complete picture of Plaskon merit as the new Hobart Meat Chopper for retail food stores. This machine weighs 130 lbs. and every chopper is built for heavy duty. Its housing had to be beautiful, strong, sanitary, with a permanent finish.

And, for perfect harmony in the schemes of many new and modernized stores, it must be furnished in various colors—delicate green predominating. The selection of Plaskon—molded color—assures satisfaction on every count.

For achieving a Chopper of completely new design, with double the capacity of former choppers of like size, that can be sold at a moderate price, Mr.

MOLDED COLOR

JUNE 1935

David Meeker, Chief of Hobart Design and Development, Hobart Engineers, and Mr. George Graf of The Doehler Die Casting Company are to be congratulated.

The graceful sweeping lines of the green Plaskon housing; the skillful combination of plastic and brushed chromium zinc die cast parts are but two superior bits of craftsmanship which crown this beautiful and practical chopper as another Hobart accomplishment in design and appearance. It is also made with Bakelite housing. Molded by Kurz Kasch.

ATOMIZER:

Plaskon—molded color—is the favored packaging material among leading perfumers. In the possession of glorious color and adaptability to the designer's art, Plaskon has no equal. This DeVilbiss atomizer, with green Plaskon top, says better than we what we mean. Reynolds Spring is the molder.

ELECTRICAL:

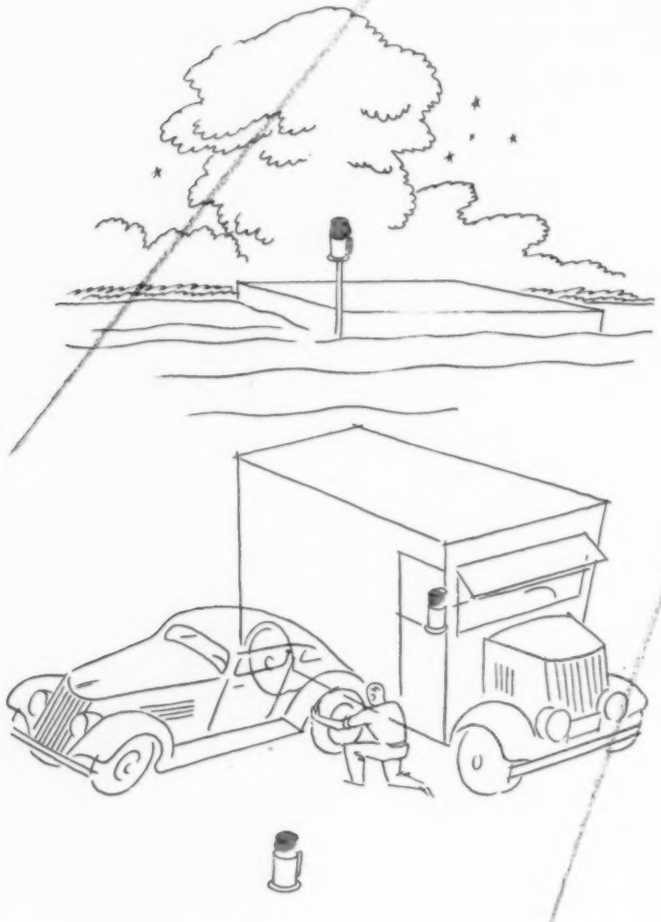
These sockets and cord handles, made by the Standard Electric Time Company, are used in connection with their laboratory current distributing panels. Made in yellow and green Plaskon, for identification on the board, these strongly dielectric sockets are so installed that there is no possibility of short circuiting the panel. The red Plaskon handle encloses the connecting cords which plug into the sockets. At the right are two translucent, ivory Plaskon pieces—a corridor dome light and a pilot light —part of Standard's ingenious hospital calling system. Molded by Colt.

TOLEDO
SYNTHETIC
PRODUCTS
INCORPORATED
TOLEDO · OHIO

Play the Red for SAFETY

IF YOU have ever had occasion to change a flat tire in the middle of the night on a country road you will vote a medal to the Delta Electric Company, Marion, Indiana, inventors and manufacturers of Powerflare, the flashing safety beacon which you can place by your side to warn approaching traffic not to come too close. Especially if the tire you have to change is on the port side and you have no one along to watch and warn you of speeding cars.

This portable electric signal lamp is equipped with a two-way-vision drum-top lamp with top shades extending at the front and back and it is claimed that its brilliant red rays are visible at a distance in excess of one mile. Fiberloid is used for lenses because of the breakage angle and it is believed this material is more satisfactory for the purpose and will stand up a lot longer than would glass.



The signal may be used with a constant red light or, by reversing its switch, it will flash on and off in a manner to attract very definite attention to its presence. It operates on a standard 6-volt lantern battery which gives about eighty hours of constant burning, or about forty hours if used with flashes. Extra batteries may be stored or carried for a year or longer, it is reported, without material loss of operating power.

Many uses are indicated where a light of this sort becomes invaluable. Trucks or busses parked along the highway give equal protection to themselves and other drivers through its use. It can be used with no danger of being blown out by wind where highways are under construction and repair. Fire departments can make use of it to warn of hose stretched across a street and State Police are using the flares for emergency lights on many occasions.

Farmers and milkmen driving horse-drawn vehicles are in constant danger on the highway during dark hours unless protected by some sort of lighting device. Kerosene lanterns are easily blown out, but this flashing beacon may be securely attached to the body of a truck or wagon by a bracket which comes with it yet allows its instant removal for emergency use at any other point.

Credit: To The Fiberloid Corporation, Indian Orchard, Mass., for Fiberloid used as lenses.

Molding for precision

by E. J. Lougee

THE new "Model S" Schick Dry Shaver with refinements which have been under constant test and examination for more than a year is reaching the market at the rate of about five hundred a day. Two additional multiple cavity molds will soon be ready and from there on fifteen hundred will be the steady pace for the balance of the year.

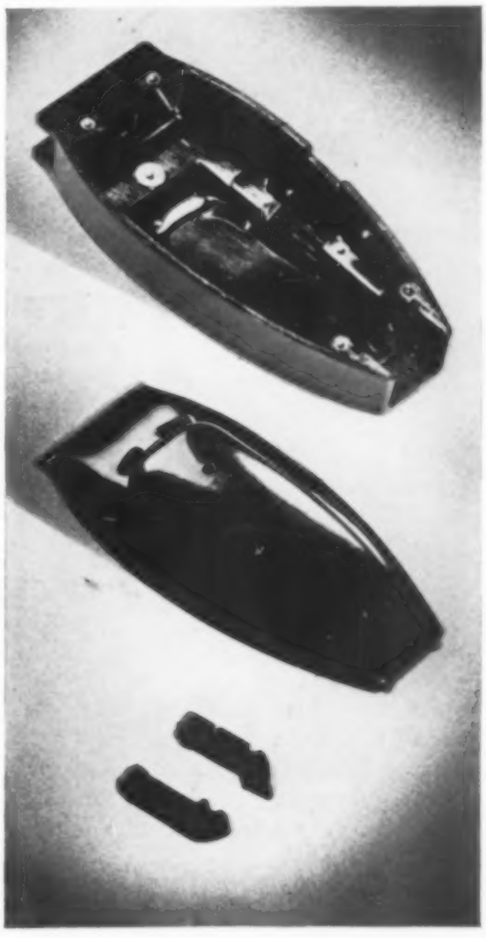
The Schick Dry Shaver presents one of the most delicate problems in the field of plastic development because of its precision requirements which can be met only by transfer molding. The handle or housing of the Shaver is designed for precision assembly and the lans on either side of the case must meet a variance of less than 0.005 inch in order to insure proper alignment of motor and cam. Brass and aluminum threaded inserts are molded into this housing with sufficient accuracy to accept the interior mechanism in assembly which is screwed into these inserts. The cover is also molded and is interchangeable with any housing.

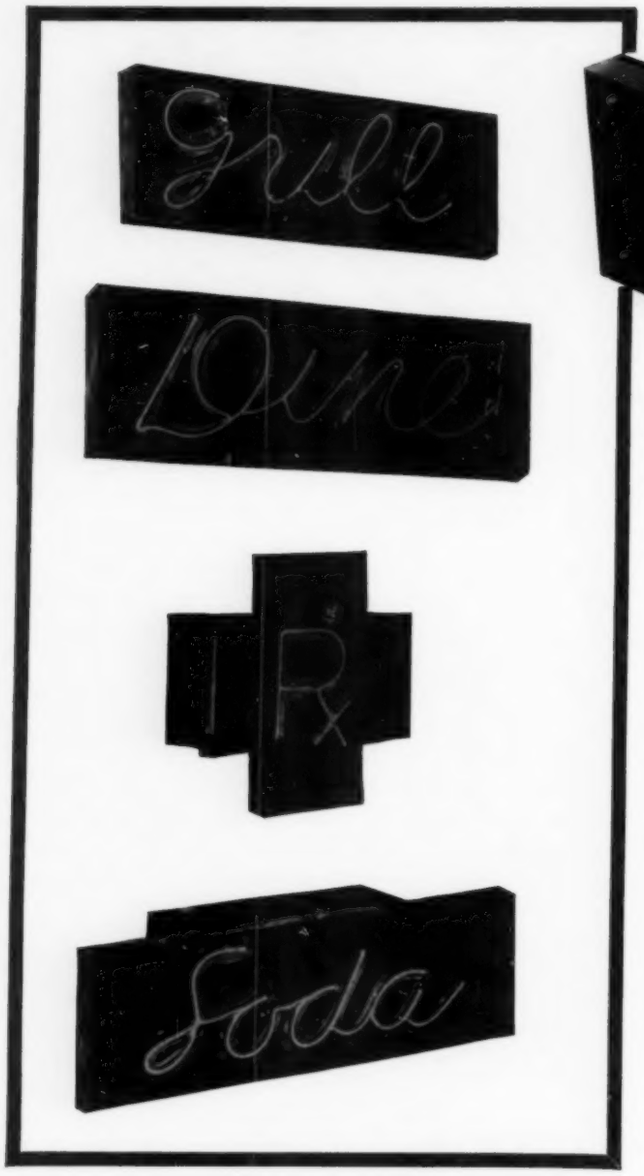
Two molded arms hold the contact points of the extremely simple make and break motor whose rapid turning actuates the single cam which moves the cutting teeth.

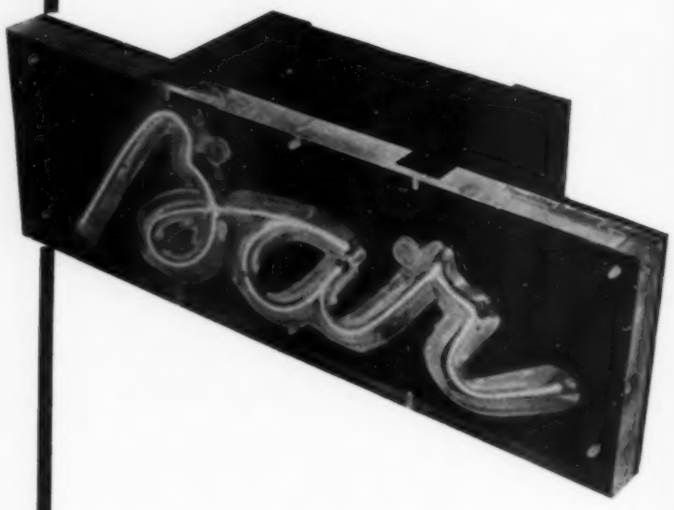
Colonel Jacob Schick has worked harder than any living man to give Americans a quick, easy shave. He is firmly convinced that within a few years, the wet, mussy, scrapey operations pursued by many today will give way to the quicker, cleaner, and safer method of the Schick Dry Shaver. He has worked harder, too, to perfect his product than most men would. The problems have been tremendous. He is constantly at it in his laboratory in Stamford. He never lets up for a minute. Right now he is experimenting with a brand new use for molded phenolics which will bridge the one remaining gap to make the Shaver foolproof.

"In its present state," the Colonel says, "The Dry Shaver will serve the average man throughout his life if he doesn't abuse it."

But men are careless. Some will forget to pull the plug after shaving and allow the razor to run until it overheats. Heat is the one enemy of the tiny motor which operates the Dry (*Continued on page 56*)







These Signs get attention

THE mention of cast resins to the average person brings to mind a host of small articles—bracelets, poker chips, pins, brooches, clips, handles and penholders. Yet, with ever increasing speed, these unusual plastics are finding widened acceptance in non-retail merchandising fields—most notably in architectural decoration and in the creation of signs.

In this last category, several divisions appear. Simplest is the non-illuminated cut-out letter, often mounted on sheets of a different color of the same cast resin. Other applications include letters illuminated from behind, such as those of a theater marquee, and letters made to glow with light by placing the light source at right angles to the line of vision. In most of these cases, the superior beauty and wearing qualities of the material have induced their choice over other previously used mediums.

Now, however, a new type of sign has been perfected which, in addition to capitalizing these qualities of cast resins, make important use of the protective features possible through the use of phenolic castings.

Resilite Indoor Displays, manufactured by the Resilite Corporation of America under patents owned by that company, consist of a neon-tubular script lettering, equipped with flasher mechanism, and set within a panel of translucent phenolic material, precast with recesses in its rear face, into which the neon tubes fit. Thus, as may be seen by an examination of the accompanying illustrations, the neon lettering is under a protective covering. This makes possible the placing of the display sign at points in windows or in the interior of stores and lobbies, within the direct eye-level line of vision—the point of greatest effectiveness. Where neon spiderwebs or even neon letters mounted on metal backings would be exposed to damage ... these signs can be safely placed without any possibility of injury to the delicate tubing.

Yet, this feature of protection—important though it may be—is not the only advantage gained through the use of cast resins. Since these cast blocks may be had in a wide range of translucent colorings, the possibilities for color variation in neon signs are immeasurably increased. The few variations possible within the tubes themselves—attained through the use of neon, krypton, mercury, etc.—are replaced by a countless series of variations of overlying tone.

Still another advantage is found in the possibility of conveying, alternately, two different though related messages—one through the shape of the cast block and the other through the (*Continued on page 54*)

TENITE knobs and fittings in ivory and gray add to the pleasing harmony of interior appointments in the 1935 Ford Deluxe.

Escutcheons—American Insulator Corporation

Choke, throttle, light switches, glove box and window regulator handles—Reynolds Spring Company

Cigar lighter—T. F. Butterfield, Inc., and Casco Products Corporation

Radio knobs—American Insulator Corporation, General Industries Company, and Kurz-Kasch Company

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KINGSPORT, TENNESSEE

TENITE *on the* FORD

New ideas

● The paper industry has recently developed the art of making wood pulp with a very high alpha cellulose content (93% or better) in loosely felted, water laid sheets. Among numerous uses, this product makes silent gears having excellent properties of resilience and durability, and at relatively low cost, by compressing the sheeted material, impregnating it evenly and thoroughly with Bakelite, and molding laminated sheets of the impregnated fibers into gears. (John C. Sherman, Brown Co., U. S. Patent 1,999,062.)

● Covers for loose leaf binders, and similar flat shaped articles, are successfully produced from a combination of a molded synthetic resin layer and a softer layer, which may be rubber or the like and which is made to extend beyond one edge of the cover and to protrude through apertures in the molded resin layer. The synthetic resin is one which is hardened by the heat and pressure of molding, to give strength and rigidity to the cover, and the soft layer is also converted by the heat of molding into its final state. Furniture casters can also be molded from such a combination of heat-hardened and soft layers. (Arthur G. Rendall, Morland and Impey, Ltd., Canadian Patent 349,616.)

● Molded bearings for roll mills and like machines are being successfully made from fibrous plastics, such as synthetic resins compounded with paper fibers or comminuted textile fibers to give the bearings toughness and strength. (Willy Stodt, *Stahl und Eisen*, Vol. 55, pp. 183–185, Feb. 14, 1935).

● The serious problem of adapting curvature to other features of non-breakable (molded) watch crystals has been inexpensively solved by providing the mold with a flexible insert, for example one made of rubber, which can be adapted for molding either convex or concave shapes, in any desired curvature. Thus watch crystals and other instrument faces can be molded from celluloid or cellulose acetate at a low cost for molds, yet in a great variety of shapes. (Knut Fredholm, German Patent 609,499.)

● Pencils can be made by sheathing the pencil leads in a plastic material instead of wood, and the plastic products have several advantages such as the improved range of possibilities for decorative effects which make the pencils attractive to the buyer. (F. Lorch, British Patent 422,084.)

● Ornamentation of molded plastic articles is important in many lines of production, and many methods have been tried. A new method, which is economical and gives excellent results, is to impregnate paper, fabric, metal foil or wire cloth (according to the nature of the molded article) with a synthetic resin, and apply this material, in patterns as desired, to the molded articles by heat and pressure which harden the resin in the impregnated material and bond it firmly to the article to be decorated. The new method permits a great variety of color and pattern effects. (Naamlooze Vennootschap Philip's Gloeilampenfabrieken, German Patent 609,694.)

● Housings for small electrical apparatus, formerly made of metal but now molded from plastic compositions, have been tested for impact strength in comparison with similar metal housings. Two types of molded housing, one a recently developed resin composition of superior toughness and strength, were tested in comparison with cast iron. The older molded housings were definitely superior to the cast iron in impact resistance, but the new type of molded product was still better and was quite unaffected by impacts which broke both the others. (Paul Grodzinski, *Kunststoffe*, Vol. 25, pp. 88–89, April 1935.)

● Costume jewelry made from synthetic resins continues to increase in variety, beauty and brilliance as the art of making high grade resins in perfectly transparent qualities is advanced, and as the possibilities for coloring these transparent resins become greater as to range and purity of color effects. These improvements in the art permit intricacies of pattern and design which enable the jeweler to offer an infinite variety of irresistibly attractive articles at comparatively small cost. Bracelets, brooches, necklaces, charms, rings, eardrops, cuff links, hair ornaments and bar pins are a few among the many articles which are being made in the newest designs, taking advantage of the new possibilities. (A. Roedter, *Plastische Massen*, Vol. 5, 106–108, April 1935.)

● A new molded container for cigarets has a close-fitting cover which is corrugated to accommodate the cigarets in the top row, and is cleverly designed for adequate ventilation, with space arrangement for withdrawal of cigarets with minimum handling and disturbance of those remaining. The new container, which is also made in sizes and shapes for cigars, is designed and manufactured by a concern located in Coburg, Germany. (*Plastische Massen*, Vol. 5, p. 75, March 1935.)

● The auto and motorcycle show in Berlin early in 1935 disclosed a great number of uses for molded parts, some of them hitherto made exclusively of metal. Among the improvements recently introduced are hollow molded gear shift balls to replace the solid balls, speedometer housings, fuel pump housings and molded insulation parts, and perhaps most novel of all a non-fogging, ventilated face shield, of Cellon, to be worn by the rider. This shield has a colored visor to shield the eyes and a colorless face cover, ingeniously arranged to permit ample flow of air while at the same time protecting the rider from wind, rain, dust and insects. Another item which was exhibited although kept off the market by patent complications was a new design for molded handlebar grips; here again ingenuity is evident in an arrangement for combining the movable type of grip with the necessary connections for its use in fuel feed control. (A. Herz, *Plastische Massen*, Vol. 5, pp. 93–101, April 1935).

● Molded containers for dry cells, with hexagonal compartments according to the number of cells to be held, are made from Bakelite or a like material, either in one piece or in two corresponding pieces, one fitted to receive the bottoms of the cells and the other to fit over the tops of the cells. In the latter form the middles of the dry cells are exposed to air. (J. A. McKee, R. S. Scott and R. A. McKee, British Patent 421,053.)

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OLD Topper is not just another shaving bowl—it is rather a distinguished affair, well-planned, good looking, thoroughly practical. And made to sell at the surprisingly low price of ten cents. The greatest contributing factor to its low price and merchandising appeal is its smart molding of black plastic which, when empty, becomes an equally smart and practical ash tray.

This new shaving bowl is especially designed to be practical in everyday use. It is light in weight, ample in size to hold a generous portion (one and one-half ounces) of quality soap, and fits the hand to give a splendid holding grip even when one's hands are wet. The cigarette slits have been carefully placed and serve as finger grips while the bowl is in use for its original purpose.

The soap can be used to the last sliver without ever slipping about because of the planned shape of the bowl which has a recessed well at the bottom with three molded in lugs which hold the soap firmly in place until completely used, and prevent it from slipping out of place while being brushed for lather. The soap is so firmly wedged into this recessed well that it cannot slip out while on display in a store even if the bowl is turned bottom up.

"Old Topper" is provided with a simple but adequate closure of paraffined board suitable for protection on display and for use in packing the bowl for travel. "We feel," says Allan Pradt, of Pradt and Smith Company, makers of Old Topper, "that a cover should not be used from day to day as it is better to allow the soap to dry out. If covered, water is trapped in the bowl where it softens the soap and leaves it spongy." Of course, the paraffined closure is also partially responsible for the extremely low price for which this bowl is permitted to sell. A molded cover would cost nearly as much as the bowl itself and preclude any chance of profitable sale within the ten cent bracket.

When Mr. Pradt first began work on Old Topper there were few shaving bowls on the market for less than a dollar, and several imported numbers sold for even higher prices. It was his idea to develop a truly practical bowl with a good quality soap to retail in the chain stores. Choice of materials became a real problem. Wood was at first considered but was discarded after tests because it warps when wet and is bulky to make and ship. Even the expensive shaving bowls of wood frequently absorb soap and lose their original neat appearance within a short time. Investigation of available material pointed strongly to plastics if the planned selling price of ten cents was to be attained. "It not only satisfies cost," says Mr. Pradt, "but is, in fact, the best material we could possibly use even if cost were no object." (*Continued on page 60*)

★★MAKALOT MONEY-SAVING NEWS★★

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Makalot long ago realized that certain molding jobs required out-of-the ordinary resins. Today, Makalot supplies specially made resins for dozens of exacting jobs... improving the qualities and appearance of the finished piece while cutting molding costs to a minimum. Noteworthy are a black, non-bleeding material developed for closures, an arc resisting material superior to any yet made, a Bobbin material for the Textile Industry that withstands saturated steam and an unusually strong shock resisting material possessing superior flowing qualities.

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Makalot resins have the lowest melting points of any of the phenolic resins. Hence they cure more quickly. Results ... dollars daily cut off your press-time charges, greatest single factor in molding costs. Faster cure means faster, less expensive production and fewer, smaller molds.

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IF FOR no other reason than sheer curiosity, salesmen have little trouble getting prospects to take a peek at their products through TRU-VUE, an inexpensive pocket-size projector of molded phenolic.

The result is amazing because objects are given the benefit of "depth-photography" which makes them appear to have a third dimension when viewed through the projector. People in them almost come alive—while you'd swear you could walk around the buildings or actually get in and drive away the car you are looking at

Proctor & Schwartz Electric Company, in Philadelphia, used TRU-VUE projectors as a mailing piece to a number of selected dealers and jobbers as an announcement of their summer iron campaign. The film enclosed with the projector contained thirty pictures

showing the iron and its various features, plus the advertising and other promotional material they are putting behind it. A projector and the same film were supplied to their jobbers' salesmen so they could show the campaign plans to their dealer customers.

The TRU-VUE has caused considerable favorable comment from the trade, they report, and it serves to get far more attention from buyers than an ordinary broadside on the same story could get. Mr. Walter M. Schwartz, Jr., vice president of the company, says that many of the jobbers' salesmen are finding it effective in presenting their story to the trade.

Mr. L. B. Wall of Arbuckel Brothers, New York, says: "A group of chain stores was sold a substantial order through the TRU-VUE demonstration—an account we were heretofore unsuccessful in selling. Our salesmen were most enthusiastic in their comments about the device and its value as a sales help."

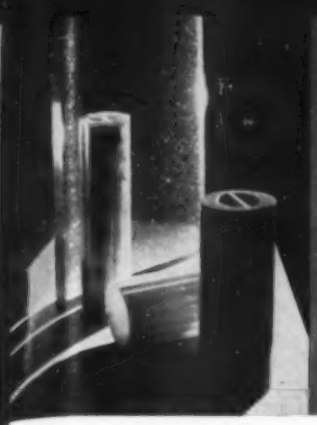
Of course, the important thing about the projector is that its makers, TRU-VUE, Rock Island, Illinois, chose plastic material for its manufacture. "We decided on plastic material," says Mr. M. S. Carlson of TRU-VUE, "because of its outstanding characteristics, and because it readily lends itself to molding our unit. It resists scratching, denting and corroding. It is substantial but not heavy. Trademarks may be molded in to look well, and the high gloss, depth of color and finish make it an unusually attractive piece of merchandise."

The views are changed progressively to tell a straightforward selling story by the simple sliding movement of a projecting lever.

Thousands of TRU-VUES have been sold in department stores from Wanamaker's in New York to Bullock's in Los Angeles, and a complete library of educational and entertaining film is constantly being added to by the makers.

It is interesting to note this practical adaptation to commercial use of an item usually associated with toys and gifts. Its attractive plastic molding no doubt contributed to its success in both fields.

Credit: The Bakelite Corporation for Bakelite used in TRU-VUE; and to Barber-Colman Company, Rockford, Illinois, for the molding.



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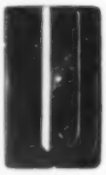

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The use of molded plastics in applying WOOD VENEER

Lawrence E. Stout and R. J. Collins,
WASHINGTON UNIVERSITY, SAINT LOUIS, MISSOURI

THE use of various synthetic resins has been a source of investigation for the last twenty-five years. The list of uses which have been discovered, up to the present, is very impressive but little has been reported on the use of a resin as a bonding agent in applying wood veneer. A study of the literature revealed but one short paragraph on the use of Vinylite sheets in applying veneer to furniture.[1] The lack of previous work is rather surprising when one considers that phenol resins have been used as a binder for grinding wheels with marked success.

Probably the greatest defect of veneer is its tendency to peel off when in contact with moist air. The moisture seems to dissolve out the water soluble glue binding material. Hence, the use of such an insoluble material as phenol-formaldehyde condensation products appears to be an excellent solution to the problem at hand. The use of Vinylite is restricted by its cost. The use of the common phenol-formaldehyde type resin is undoubtedly the most economical and hence is the material used in this investigation. The authors were encouraged by the fact that the previous investigators[1] stated that pressures and temperatures necessary to effect a bond in applying veneer with Vinylite are not detrimental to the veneer.

A phenol-formaldehyde condensation product was prepared by heating under reflux for 20 minutes 100 parts by weight of phenol, 90 parts of a 35% aqueous solution of formaldehyde and 30 parts of ammonium hydroxide, 26 per cent. After this period of time the resinous product is clearly visible. The entire mix is then poured quickly into water and the solidified resin dissolved in acetone. If the reaction is watched carefully it is possible to stop the reaction before the hard-brittle resin forms and thereby cut down the subsequent time of solution.

The acetone solution of the resin was sprayed on one side of a 4 in. × 4 in. piece of maple. After drying, the pieces of wood were assembled into three ply samples and molded in a 6 in. × 6 in. Elmes Hydraulic Press—equipped with electrically heated platens—top and bottom. All samples were steamed for two hours over an open steam kettle to test the durability of the bond. Comparison was made with three ply glued samples steamed over the same kettle. It should be remembered that by such a test a very severe strain was set up in drying. The samples became thoroughly wet during the steaming. The test, therefore, was very severe on the strength of the bond.

Hawley[2] states that wood begins to decompose at about 527° F. We also know that heat and moisture tend to lower the strength of wood. Therefore, the range of temperature and pressure that can be used is quite restricted.

The acetone film of resin must be dried thoroughly so as to remove the acetone. Failure to do this is dangerous to the worker and to the wood but is a source of loss of acetone.

Optimum Strength of Solution

The simplest method of controlling the quantity of resin applied to the wood was by adjusting the concentration of the acetone solution. The minimum quantity of resin required was determined by preparing solutions of the resin in acetone in concentrations varying from 2 to 40% resin, by weight. The solutions were sprayed on the wood samples and the resulting product dried and molded at 3000 lbs. per sq. in. for 16 minutes at 325–350° F. Previous work had assured the authors that molding was assured under these conditions. All samples treated with solutions above 10% in strength were satisfactorily bonded, and were unaffected by steaming for a two-hour period. At very high concentrations the solutions become quite sticky and hard to handle. Below 30–40% concentrations the spraying properties were excellent.

In all subsequent tests a 15% solution was used so as to provide an adequate safety factor. With this solution it was no uncommon thing to find that strains set up during the steaming and subsequent drying would split the wood along the grain but leave the bond unaffected.

Covering Power

The covering power of the 15% solution was approximated for the samples coated with the material. It was found to be 0.107 lbs. resin per sq. yard of surface.

Optimum Molding Temperature and Pressure

Samples were molded using pressures from 1000 to 3500 lbs. per sq. in., in 500 pound steps, and temperatures from 225° F. to 375–400° F. The samples were all steamed, if they showed (*Continued on page 60*)

[1] Davidson and McClure, Ind. Eng. Chem., 25, 648 (1933).

[2] Hawley and Wise, "Chemistry of Wood", Chem. Cat. Co., 187 (1926).

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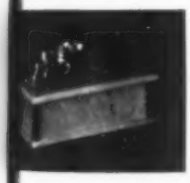

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KEEPING POSTED

Molded Plastics Give Positive Protection to Delicate Device

Most executives have shuddered at the shrill nocturnal shriek of rumbling fire apparatus thinking their own place of business might be going up in smoke. Even those whose plants or homes are sprinkler-equipped are not wholly free from the terrors of smoke and water damage which might run into a considerable sum even though the fire burns little before it is automatically brought under control.

A device called a SPRINK-LA-STAT, made by the GAMEWELL CO., Newton, Mass., is an adaptation of the standard Rockwood solder type sprinkler head to a heat-actuated fire alarm device and is quite new in the automatic fire alarm field. It transmits an alarm upon "discovering" a fire, instead of showering water upon the blaze.

The SPRINK-LA-STAT is not intended to replace sprinkler systems, but rather for use in such locations as museums, fur storage vaults, libraries, above expensive church organs and electrical apparatus, where a drenching with water would be disastrous.

The circuit opener, designed to provide a most positive method of sending an alarm, has rugged silver contacts enclosed in a duct-proof cylindrical two-piece molded phenolic housing which eliminates all danger of corrosion. Convenient circuit terminal connections are provided on the cover of the housing into which they are molded as integral parts.

Forty-five SPRINK-LA-STATS have been in service

FOR
HIGH PRODUCTION
THERMOPLASTIC MOLDING

Southwark is constantly studying the equipment requirements of thermoplastic molding for the purpose of offering methods and machines for cutting manufacturing costs, for increasing production rates and profits.

As an example, 1,500 molded tube bases per press hour is the production rate in a large lamp works. As one workman is capable of operating two such presses at a time, the rate permitted with this type of equipment is 3,000 tube basis per man hour.

Nearly a century of accumulated experience stands behind Southwark's engineering and production of such equipment. Today, countless products of widely varied character are made more profitably on Southwark machines.

Have you considered how Southwark might help you? Whatever your manufacturing problems, be they large or small, standard or special, consult Southwark. An interview will not obligate you in any way.

BALDWIN-SOUTHWARK CORP.
Southwark Division Philadelphia
Pacific Coast Representatives:
The Pelton Water Wheel Co., San Francisco

SOUTHWARK

CONSULTANTS ON MOLDING EQUIPMENT
BURROUGHS ENGINEERING CO.
NEWARK, NEW JERSEY

WHERE ACCURACY IS REQUIRED ON A TIMING DEVICE "WATERBURY" IS CALLED IN

MOLDERS OF
BAKELITE—DUREZ
BEETLE—UNYTE
PLASKON—TENITE
SHELLAC

CUSTOM MOLDERS
OF PARTS TO YOUR
SPECIFICATIONS

LET US HELP YOU WITH YOUR PLANNING AND DESIGNING

THE WATERBURY BUTTON CO.
PLASTIC DIVISION
EST. 1812
WATERBURY, CONN.

KEEPING POSTED

in airplane hangars at Wright Field, Dayton, Ohio—the most important U. S. Army airport in the country—for a year and a half without any reported trouble of any kind.

TO SEE AND TO LEARN

Those who like to keep a finger on the pulse of trends and cock a weather eye to developments of the future will have ample opportunity this summer to witness innovations and prognostications for fall business through the various Business Shows staged for their benefit. Those in plastics will be especially interested to watch for new uses of the material and since one new use invariably suggests others, it will be surprising indeed if startling results are not apparent.

First of these events scheduled is the Summer Lamp Market which is predicted to be the greatest event of its kind ever held anywhere. It opens on July 8th and continues through July 20th at the Merchandise Mart in Chicago. Mr. E. G. Wellin, Sales Promotion Manager of the Merchandise Mart cites the fact that 80% of the exhibitors in the Winter Market have already signed and that more applications from New York manufacturers have been made than ever before which assures lamp buyers from everywhere a display which truly represents the cream of the crop.

The lamp market is held concurrently with the furniture and floor covering markets which means that assembly buyers can accomplish their whole buying job at this one market.

Another show which, in view of progress being made in modern design for mass production, should excite widespread interest, is the New York Housefurnishing Show at Hotel Pennsylvania from July 10th to 19th. It will be interesting to discover just how well those in the housefurnishing industry have availed themselves of plastics in their furtherance of modern furniture. Here is a field with illimitable opportunity to both furniture manufacturers and those engaged in producing and fabricating phenolics and ureas, and the Show at the Pennsylvania should offer a splendid occasion for their better mutual acquaintance.

Another Exposition, while yet some distance ahead, seems worthy of mention at this time. The 15th Exposition of Chemical Industries which occurs this year will be a truly great industrial event to judge by the factors and forces which are increasing in momentum at this time when the show is still six months away. The Exposition will be held during the week of December 2–7, 1935, at Grand Central Palace, New York City. In addition to its display of raw materials and finished products the event this year promises to be a great exposition of equipment in terms of heavy plant

KEEPING POSTED

machinery and the innumerable accessory machine units which serve the great industrial plants and represent the handling of mass production operations after they have been worked out in the laboratory and semi-work's production scale. Quite naturally this trend will be responsive to the fact that the American market, after years of depression, has a stored up demand for capital goods and for plant equipment generally, to replace units which the mere factor of obsolescence should have replaced sooner. Statisticians point out that there is more than $100,000,000 set aside for new plant projects in the chemical industries. As a background for building and machine maintenance the chemical processes to be handled must certainly be advanced by the unprecedented backlog of research facts which are available. The factors of accumulating reserves, improved business confidence, obsolescence, and the trend toward new product development, must inevitably combine to make the 15th Exposition of Chemical Industries a natural market place.

OBITUARY

Mr. Andrew Terkelsen, President of the Terkelsen Machine Company, Boston, Mass. passed away at his home Friday, May 24, 1935.

BEL GEDDES AND HOWE NOW PARTNERS

It was recently announced that Norman Bel Geddes of New York, and George Howe of Philadelphia have joined forces in the Norman Bel Geddes George Howe Company, Inc., at 128 East 37th Street, New York City. Mr. Bel Geddes is well known for his work in industrial and theatrical design, especially in the various fields of transportation. Mr. Howe, formerly senior partner of Howe & Lescaze, is internationally known in the architectural field. He has moved to New York and will take an active part in all the work of the new organization. The overlapping of their fields of activity and the common objective and purpose of their work have convinced both Mr. Bel Geddes and Mr. Howe that a coordination of their separate but related activities in a single organization is a logical step.

BLUTHARDT WESTERN MANAGER FOR R-B-H

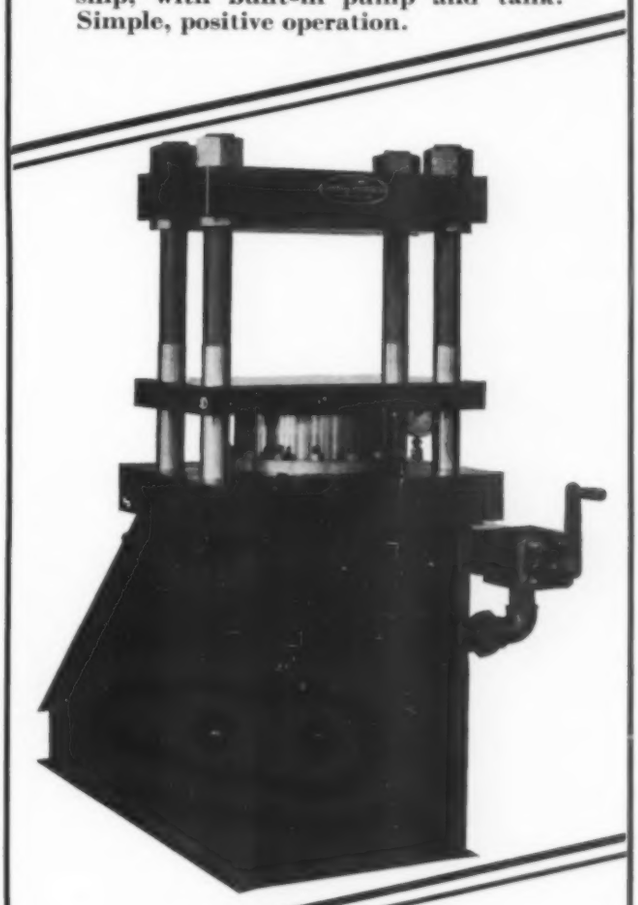
H. J. Hemingway, President of R-B-H Lacquer Base Company takes pleasure in announcing that Mr. O. D. Bluthardt, who has been representing that Company throughout the Mid-West for the past five years, has been advanced, effective as of May 1st, to the capacity of Western Manager. He will devote his entire time to the sale of R-B-H Dispersions, and will continue to operate from their Chicago Office at 59 West Austin Avenue, Telephone Number, Superior 7147.

LOGEMANN

HIGH-SPEED HYDRAULIC

MOULDING PRESSES

Absolute accuracy to produce the finest work. Two-speed operation for high production. Platen clearance adjustable. Sizes and pressures to meet all requirements. A compact, self-contained, unit, of the best material and workmanship, with built-in pump and tank. Simple, positive operation.



Back of the Design—

50 Years' Experience!

Efficient, yet simple in design—without cumbersome attachments—these presses are the result of more than 50 years' manufacturing experience.

LOGEMANN BROTHERS CO.

3158 W. Burleigh St. MILWAUKEE, WIS.

PRODUCED BY BOONTON • MASTER MOLDERS OF PLASTICS

Molded film cartridge for VISOMATIC SYSTEMS, INC.

Planning a new molding job? Something tricky—requiring hairline accuracy? Then study this Visomatic cartridge—designed and molded in Bakelite by Boonton! Case and cover—each is molded in one operation, complete with film slot, bead and undercut. In use, they snap together like a fine watch case—no possibility of dropping apart. Yet a flip of the finger and the cartridge is open for change of film.

If you have a molding job—big or small, complex or simple—consult these master designers and engineers. Without obligation.

● *Address Boonton Molding Company, 40 Charlton St., Boonton, N. J.*

BOONTON
MOLDING COMPANY

Master Molders of Plastics
Phenolics, Ureas and Cellulose Acetates

KEEPING POSTED

ATLANTIC COAST PREMIUM BUYERS' EXPOSITION

Following the success of the National Premium Exposition held at the Palmer House, Chicago, week of May 6th, an Atlantic Coast Premium Buyers' Exposition will be held in New York, September 23–27, 1935, at Pennsylvania Hotel. It is reported this action was taken at the request of numerous large premium buyers and manufacturers and will enable them to enjoy benefits and economies of such an activity. Here the premium buyers in this section and premium manufacturers will meet on common ground, and in a few days accomplish what would otherwise require much time and expense.

The Premium Advertising Association of America, Inc., will hold a series of convention sessions and round table conferences concurrently with the Exposition, extremely interesting and beneficial to both premium buyers and sellers. The Exposition announcement is being prepared and will be mailed prospective exhibitors very shortly. A. B. Coffman, of the Merchandise Mart, Chicago, is Exposition Manager.

"SORRY"

Ronyx, through error of the editor, was classed as a cast resin material in Mr. Chase's article, "What's in a Button?" (MODERN PLASTICS, May, 1935). Instead, Ronyx is a machinable plastic offered in the form of sheets, button blanks, buckle slides, etc., but is not cast resin.

BUSINESS IS GOOD

Unaudited net operating profits of the Monsanto Chemical Company for the quarter ended March 31st were $757,195 which, after subsidiary preferred dividend requirements, amounts to 85.3 cents a share on the 864,000 shares outstanding.

Adding Monsanto's proportion of earnings of controlled subsidiaries and including the earnings for the period of The Swann Corporation, which this month was acquired by a merger, total net earnings for the quarter were $925,324. This amounts to 96.4 cents a share on the 959,554 shares which will be outstanding when the exchange of stock occasioned by the merger is completed. The first quarter earnings for 1934 were $674,117 or 78 cents a share.

President Edgar M. Queeny reported operations and sales were at a high level during the quarter and that current sales continue satisfactory.

KEEPING POSTED

CREDIT WHERE CREDIT IS DUE

In our article "Redesign brings big order for Hobart Meat Choppers" (MODERN PLASTICS, May, 1935) we unintentionally neglected to mention that the housing was of Plaskon molded by Kurz-Kasch Co.

MACHINING OR SANDING POSSIBLE WITH NEW DUREZ MATERIAL

For molded plastic parts requiring sanding or machining operations and subsequent re-polishing, General Plastics announces a new Durez material, called 114 SB black. Telephones, instrument cases, machine parts and many decorative objects are sometimes partially machined or sand-buffed for certain reasons, and on ordinary molding materials the sanding or buffing will uncover flecks of the fibrous filler and in general spoils the color. This new Durex material, however, has a greater depth of color, and a peculiar make-up which permits subsequent polishing to a soft, rich, satiny lustre even after complete grinding off of the natural surface. It has a flexural strength of 10,000 P.S.I. and compressive strength of 28,000 P.S.I. and molds on regular cycles.

EXPANSION

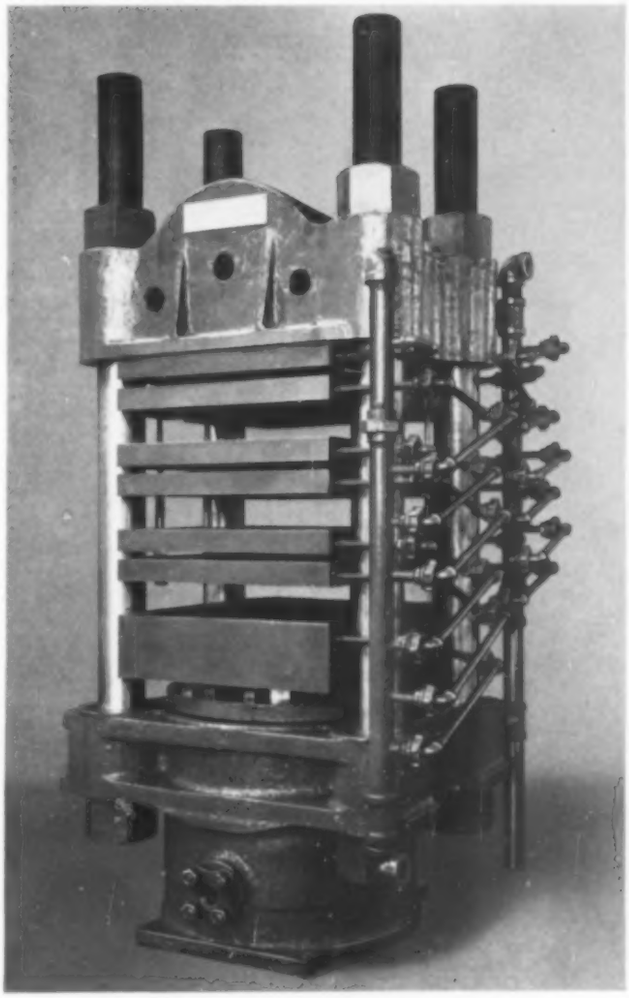
The Makalot Corporation of Boston, Mass., makers of thermo setting compounds, is meeting the challenge of increased demand for its products by increasing its plant capacity. Additional rolls are being installed, as well as large Ball Mills and a blender of greatly increased capacity.

WERNECKE WITH GENERAL PLASTICS

Harvey W. Wernecke, formerly with the sales staff of McGraw-Hill Publishing Co., has joined the Chicago sales force of General Plastics, Inc., North Tonawanda, N. Y., maker of Durez molding material. Mr. Wernecke's office is at 221 N. La Salle Street.

RESEARCH

The Lea Manufacturing Company, Waterbury, Conn. manufacturers of buffing and polishing compounds, announces the addition of Mr. Palmer Langdon to its Research Staff. Mr. Langdon will have charge of an important piece of research work started a year ago by the company in abstracting and indexing all available articles and papers, published or read since 1900, pertaining to buffing and polishing. The Company feels that such work when completed will be invaluable as a reference library to those in the trade producing articles requiring buffing and polishing.



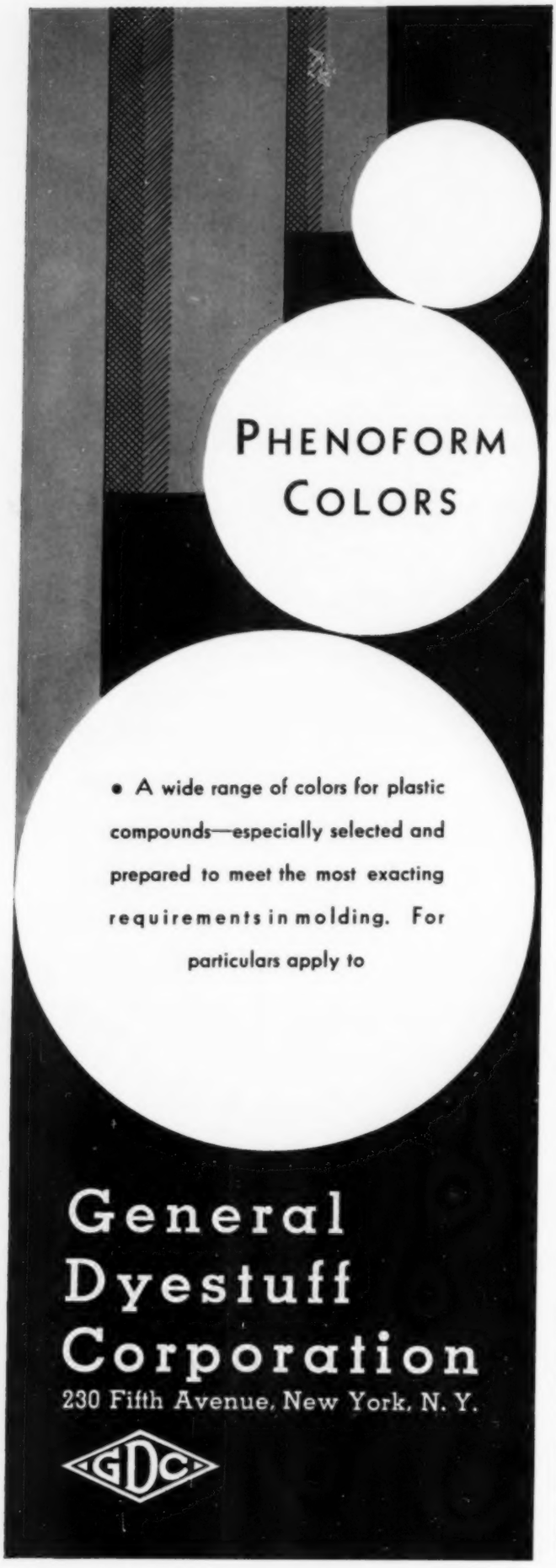
DEPENDABLE *service with reasonable first cost and low maintenance cost are some of the reasons why leading engineers specify*

BARCO
Swivel Joints

As standard equipment upon this Baldwin-Southward steam platen press of eight hundred tons capacity, twenty-five Barco Swivel Joints provide unfailing leak-proof action. They are equally fluid tight under suction or pressure—do not leak under the stress of alternating steam and cold water. Long life adds the desirable feature of low maintenance cost to their dependable action.

Write for catalog 254

BARCO MANUFACTURING COMPANY
1813 Winnemac Avenue Chicago, Illinois


PHENOFORM
COLORS
• A wide range of colors for plastic compounds—especially selected and prepared to meet the most exacting requirements in molding. For particulars apply to
General
Dyestuff
Corporation
230 Fifth Avenue, New York, N. Y.
GDC

LETTERS

PLASTICS VS. GLASS

The Editor:

Sir:

The article "Give Us Facts" in your May issue illustrated on page 12 showing interior lobby of a commercial building.

Your comment relating to the lighting from a ceiling of structural glass, "There is, again, no reason why, in place of glass, some resinous material might not have been used."

Our experience and research has failed to develop plastic materials with the light transmitting properties and light diffusing properties of glass. The wood fillers used with urea plastics variously effect light transmission. Cellulose acetate in a water-clear form has the necessary transmission of light but when attempts are made to diffuse the light, either for the purpose of preventing glare or for uniformity of illumination and pleasing appearance light transmission is seriously affected.

Many desired decorative effects and many structural advantages are available with the use of plastic materials in artificial lighting but we have yet to develop the plastics in the form of an efficient means of utilizing the lumens of electric lamps for maximum foot-candle illumination. It is the lack of light-transmitting properties that has retarded the use of plastic materials in the general field of artificial illumination.

Very truly yours,
The Safety Car Heating and Lighting Co.
L. Schepmoes,
Manager, Fixture Department

New Haven, Conn.
May 14, 1935

P. S. Of interest along the above-mentioned lines is the reference on page 42 of your May issue to the use of glass wool as a filler for plastics.

Mr. Schepmoes, in a succeeding letter, points to the difference between the use of molded plastics or glass as light-reflecting mediums. "Our comments," he says, "were directed particularly to the use of plastics as light-transmitting, or where light from the source must pass through the glass or plastic for illumination at the useful plane. It is the loss of light by absorption when passing through the material which makes molded plastics, in their present stage of development, inefficient as compared with glass."

Export of chemicals and allied products from the United States to Cuba reported a substantial gain during 1934 over the preceding year, according to figures compiled in the Commerce Department's Chemical Division. This increased trade was particularly evident, it is pointed out, in the case of fertilizers, medicinals, paints, varnishes and rosin.

SEND YOUR PLASTIC *specifications* TO *Stokes*

38 YEARS EXPERIENCE *is your Service Guarantee*

Let our molding specialists work with you in producing just the right type of molded part for that important job. You will find our service most helpful at every point, from original plans to final delivery.

Moulders since 1897

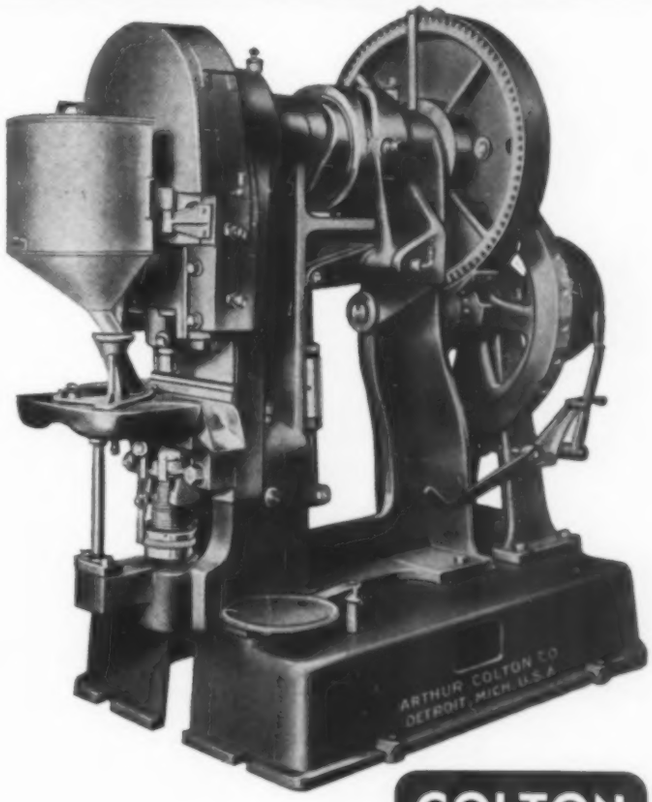
The beauty and practicability of STOKES Plastics are illustrated by the above photo. We can prove their economy if you will but get in touch with us.

J. Stokes RUBBER CO.
TRENTON, N. J.

COLTON Preforming Machines have won wide usage because of their inherent sturdiness, their uniform, speedy and satisfactory performance.

Note the new, improved 5½ Tablet Machine shown at right. The solid steel frame insures perfect operation; the improved die fasteners, improved cam construction, heavier ejecting arm brackets and vanadium steel plunger make possible high speeds without fear of breakdown or lowered quality. In every particular, we believe, this machine is by far the finest the market has to offer.

The 5½ Tablet Machine makes tablets up to 3′ in diameter and having a fill depth of 2⅛″. Other Colton Preforming Machines—single punch, multiple and rotary—are likewise outstanding in construction and performance. Write for literature on these machines or have our engineers visit your plant—



ARTHUR COLTON CO.
DETROIT, MICHIGAN

COLTON DETROIT

PLASTIC MOLDING

★

Producers of the finest in molded parts for over forty years

SHAW

SHAW INSULATOR CO.
Irvington, N. J.

—UNINTERRUPTED SERVICE—

May Be Had

GUARANTEED

By Applying

LOOMIS SWING JOINTS

To

Your Flexible Connection Problems

Manufactured and Sold by

EVARTS G. LOOMIS
126 So. 14th St. Newark, N. J.

LITERATURE

Electrical Application

Joseph C. Rah & Co., Manufacturers' Engineering Service, of Chicago, has developed a leaflet titled "Electrical Application of Plastics" in which are presented some examples of molded and laminated plastics for indoor and outdoor service, advantageously designed and treated by them to give increased satisfaction in use. Another leaflet called "Moisture Proofing" tells us that moisture is the most active factor in deterioration and aging of electrical insulation, particularly that made wholly or in part of fibrous or cellulose materials. Then it goes on to tell what should be done about it. Both leaflets will be mailed for the asking.

Air Conditioning

Any one interested may have a copy of a new bulletin offered by Leeds & Northrup Company of Philadelphia which has just been issued on the application of electrical thermometers to the "Efficient Regulation of an Air-Conditioning System."

In a concise, orderly way, this unusually well-illustrated, 24-page booklet tells the owner, the architect, the engineer and the contractor what each needs to know about electrical thermometers. Just write for Bulletin 4001.

Bearing Mountings

Every one interested in bearings for any industrial use will want to read the new 12-page bulletin called "Standard Appliances for Anti-friction Bearing Mountings," issued by The Bearing Appliance Company, of Ardmore, Pa., which suggests the desirability of standardization of all parts involved in complete bearing assembly.

The bulletin discusses material, groups and types, closed covers, open covers with flingers, open covers for leather or composition oil seals, with advice for ordering and specifying. It is well illustrated with sectional drawings and supplemented by many charts of explanation. We will gladly send a copy to those interested —just write the Editor.

Effective Publicity

"Plaskon Parade" is the title of an interesting little consumer booklet of eight pages, aimed to tell people just what Plaskon is and how it is used. It takes the first step away from being a chemical composition of urea formaldehyde, bringing it one step nearer consumer identification as a new and desirable material for every-day use.

The booklet pictures many well known objects made

LITERATURE

of Plaskon and gives an intimate sketch of its chemical growth in comparison with coal, wood and trees, which are not generally spoken of by their chemical formula.

It refers to Plaskon as molded color and indicates its application to beautiful boxes, buttons, clocks, watches, lighting fixtures, radio cabinets, toy sets, candy trays and other things in the Plaskon display at the Industrial Arts Exhibit at Rockefeller Center.

Reaching the consumer in this way is good for the industry. Too bad every man and woman in the country can't read "Plaskon Parade." We can send you a copy if you want one.

THE CHART OF PLENTY

By Harold Loeb and Associates
Viking Press ($2.50)

This volume is subtitled "A Study of America's Product Capacity Based on the Findings of The National Survey of Potential Product Capacity." It may seem a little beside the point for such a survey to be made at a time when we are not only unable to consider utilizing our untapped resources, but cannot even run our present plant at much better than fifty or sixty per cent of its rated capacity. Yet, this study (and others like it) is the logical result of our utter lack of reliable statistical information on the broader aspects of our national and business life; a lack brought glaringly forward in the last few years. For a nation that until recently did not know, within seven or eight million, the exact number of its jobless citizens, the compiling of studies such as this is undoubtedly a worthy endeavor.

While some propose sharing the wealth and others deny the possibility, Mr. Loeb and his associates have entered upon the more basic question of how much wealth—liquid and potential—there will be to share, should we ever get around to it. After an infinitude of delving into the varied resources of the statistician, the Survey brings forth its evidence leading to the conclusion that "If existing plant and man-power in the United States were fully employed in the production of honest goods and services for the consumer, the total output, valued in 1929 dollars, would be not less than 135 billions, or an average per family of approximately $4400. This figure is vastly higher than that actually achieved in that peak year . . . and in this very discrepancy may be found the one major criticism to be raised against the conclusions drawn. For these conclusions presuppose production limited only by materials and plant capacities. It goes not at all into the problem of how such production is to be achieved.

None the less, there is much within this small volume, that will be of interest to manufacturers in general and to those engaged in the plastics industry in particular.

American
RECORD CORPORATION

PLASTIC MOLDING
BACKGROUND

MORE THAN 50 YEARS
experience!

MILLIONS of plastic products have come from the molds of American Record Corporation. For half-a-century the molding of this plant has been distinguished by the qualities you will demand in your new plastic products . . . uniformity, durability, beauty, dependability, economy!

A·R·C

MOLDED PRODUCTS DIVISION
AMERICAN RECORD CORPORATION

Plant and General Offices
SCRANTON, PA.

Executive and Sales Offices
1776 Broadway, New York

Chicago :: Cleveland
Detroit :: Hollywood

DIFFICULT?....
NOT FOR KUHN & JACOB

The score-pad and card-container we mold for the Eu-Ja Company presents a number of ticklish problems that might have stumped the average molder. Three separate molded sections must fit each other with hairline accuracy . . . despite variations in the color and composition of the plastic used for the different parts.

Yet, because we are a medium-sized, owner-managed plant doing our own die making, as well as molding, we are able to *guarantee* perfect fit of any assembly of random parts.

Your problems may differ from the above. But you, too, will find the key to their solution at the plant of

Kuhn & Jacob
MOULDING *and* TOOL CO.
510 Prospect St., Trenton, N. J.
New York Office, DEfender 3-6442 Phila. Office, HAncock 0972

Complete line of
Machinery For Celluloid And Plastics Mfrs.
JOHN J. CAVAGNARO
Engineers and Machinists
HARRISON ESTABLISHED 1881 NEW JERSEY
Special Representative
Evarts G. Loomis
126 So. 14th St. Newark, N. J.

Presses for Dehydrating, Filtering, Caking, Polishing, Stuffing, etc.

Cavagnaro-Loomis Vacuum Mixer
(Patented)

Some indications of possible future price movements and of probable materials used may be gained through a study of the extent to which our present production in certain fields approaches our actual capacity. Thus the apparently unlimited capacity of our chemical industries for expansion along certain lines might indicate a gradual lowering in cost of those plastic raw-materials which are by-products of chemical manufacture.

MATERIE PLASTICHE

It is interesting to note that at least ten photographs and editorial references in the April issue of this splendid business paper of the Plastic Industry published in Milano, Italy, have their source in MODERN PLASTICS magazine. This indicates in a measure the far-reaching influence of MODERN PLASTICS and the confidence it has established through painstaking research and presentation throughout the industry. Its efforts with newspapers and consumer magazines is further evidenced on page 25 of this issue.

THESE SIGNS GET ATTENTION

(*Continued from page 34*) contained lettering. Thus a cross-shaped block of deep red resin flashes into the druggist's prescription sign or into the word "Drugs"—then drops back again to the message conveyed by the symbolic red cross. Cleaning of signs is likewise made easier, since all that is necessary is to dust or wipe the smooth casting.

Since these pre-castings are made in molds, the application of these signs is limited by cost considerations, to quantity production classifications . . . one being such stock signs as "Dine," "Drugs," "Beer," "Bar," and "Grill," another being large orders of any special lettering for nationally advertised products or chain store organizations. Within these groups, the signs can be produced at prices comparable—in view of the added advantages—with spiderweb or metal frame lettering types.

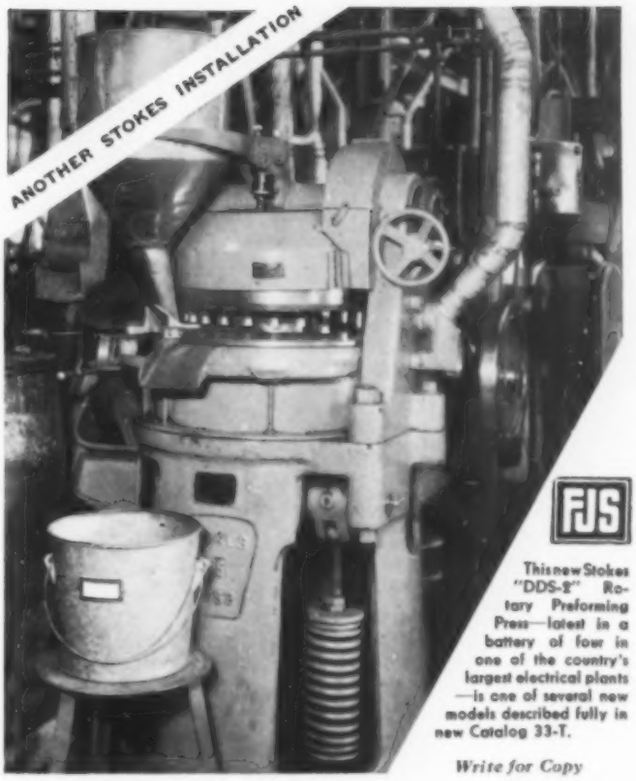
The blocks, as cast, are about six by eighteen inches overall and about an inch thick. They are attached to a back plate of the same color of cast material, thus locking the neon lettering within their combined area. Other shapes . . . such as the red-cross mentioned above are also possible. Important is the fact that the signs are truly portable. They may stand on any fixture or hang by chains, may plug into any alternating current source and—since they weigh but a few pounds may be moved at will. Important, too, is their directional value . . . since they do not dissipate their light in every direction as do exposed neon tubings. Thus, store clerks need not be constantly in the glare which is common when exposed tubing is used.

Credit: To Resilite Corp. of America for research, development and manufacture; to The Marblette Corporation, for cast phenolic material used.

MOLDED PARTS REDUCE WEIGHT OF NEW GRINDER

New design, materials and principles have made this new DeLuxe Hand-ee Grinder possible. It is a high speed electric tool which will be used by thousands of workmen in mechanical industry to do in minutes a thousand and one jobs that would otherwise require hours and even days. Extraordinary efficiency is achieved by several innovations in design. Through the use of new materials, weight has been reduced to fifteen ounces though the tool has a speed of 25,000 r.p.m. and ample power to drive a variety of different accessories. Aluminated Duraluminum is employed in the body of the tool while molded Bakelite parts are used as bearing retainers and for end caps. The new DeLuxe Hand-ee, much smaller in size than anything heretofore produced in high speed electric tools, is 6" long overall and $1^5/_8$" in diameter. The housing is streamlined with no obstructions of any kind. This is achieved through the use of a new type radial commutator and new patented "S" type built-in switch with phosphor-bronze sliding contacts. Heat, so objectionable in high speed electric tools has, for the first time, been entirely eliminated due to the radically new type fan mounting. It is claimed that the electric motor built into the tool is the highest speed and most powerful for its weight now on the market.

Due to the extremely light weight, convenient size and novel design this new grinder can be held as one would hold a pencil. Its high speed and great power allows one to mark any material as rapidly as one can write. The tool finds many uses for cleaning casting molds, reaching inaccessible places in casting and removing hard to get off deposits with a wire brush. With polishing wheels it can be used for polishing any type of metal bringing it to a brilliant finish in seconds. By the use of a novel sanding drum, patterns and wood-parts, in fact any material, can be smoothed and



This new Stokes "DDS-2" Rotary Preforming Press—latest in a battery of four in one of the country's largest electrical plants—is one of several new models described fully in new Catalog 33-T.

Write for Copy

FJS STOKES MACHINE COMPANY

Process Equipment Since 1895

5934 TABOR ROAD OLNEY P. O. PHILADELPHIA, PA.

UNIFORM QUALITY GIVES UNIFORM RESULTS

The uniformity of our cotton flocks is recognized by all users. Unvarying quality is one of their outstanding characteristics.

The leaders of industry are our best customers.

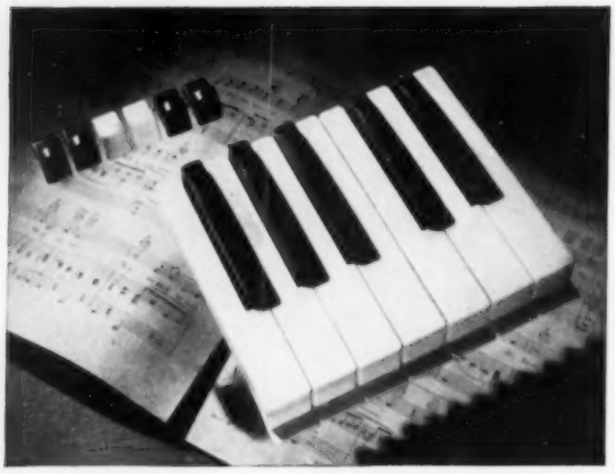
THEY KNOW QUALITY.

COTTON FLOCKS
OF SUPERIOR QUALITY FOR
MOLDING & MOLDING POWDERS

CLAREMONT WASTE MFG. CO.

CLAREMONT — N. H.

The country's leading makers.



MOLDED ORGAN KEYS

Creamy white and glistening black keys of molded Plaskon contribute their part to the beautiful appearance of the new Hammond Organ. Their beauty is permanent, too, for they will neither fade nor discolor. And they are as practical as they are beautiful; their light weight and absolute uniformity help to make possible the fast action which is a feature of this revolutionary instrument.

As usual, the Hammond Clock Company chose Chicago Molded Products Corporation to handle this exacting job. The same facilities are at your disposal.

CHICAGO MOLDED PRODUCTS CORP.
2146 Walnut St. Chicago, Ill.

Phthalic Anhydride Flakes

CHEMICALS OF QUALITY
Monsanto
ST. LOUIS, U.S.A.

sanded more rapidly and better than by hand methods. Soft metals such as brass, aluminum, magnesium, zinc, babbit and others can be worked with a process new and unlimited by using hardened steel cutters and the DeLuxe Hand-ee Grinder. Carvers, artists, pattern-makers and others will find this tool invaluable in this connection. Particular attention has been paid to the aesthetic appearance of the unit which is novel in industrial design. The thought is that workmen will be inclined to treat this precise instrument as they would a fine micrometer due to its appearance and refinement. Many tests of the tool have been conducted in all lines of industry and there is every indication that it will find a definite place in the labor and time saving equipment of every modern shop due to the improved quality of work and wide application of the unit.

Credit: Housing molded by Grigoleit, Decatur, Ill., from Bakelite.

MOLDING FOR PRECISION

(*Continued from page 33*) Shaver, but when Colonel Schick's current experiments have reached a successful conclusion and have been protected by patents, this final bug will be removed by an entirely new application of molded plastics. Molded phenolics have contributed materially to the success of the Schick Dry Shaver. And contrary to any opinion of wet shavers, it is a success. If you could walk through the clean, sunny,

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WANTED TO PURCHASE, part interest in small Catalin working shop capable of doing general custom work ... located in or near New York City. For contact, write full details to Box 118, Modern Plastics.

•

CHEMICAL ENGINEER graduate, age 27, 5 years' experience in plant and laboratory work, desires position with opportunity for advancement. Reply Box 119, Modern Plastics.

model plant as I did and see the care and precision with which every part is made and assembled, and let the Colonel tell you of the painstaking supervision he gives every operation, you would realize why the Dry Shaver is a success. "The plant and everything in it," says Colonel Schick proudly, "came out of profits."

It all began while Colonel Schick was in the Army. He noticed that shaving among the men was a major problem. His own tought beard was no exception. He considered the fact that since men began to shave the method had remained the same. The safety razor offered a certain definite convenience over its predecessor but the scraping operation was identical. Each shave constituted a minor operation which could not possibly avoid leaving a condition of scar-tissue in its wake.

This housing dug by hand from a solid block of Bakelite indicates the precision with which Schick toolmakers work. Four days labor is represented in this perfect specimen

The thought obsessed him. All his life he wanted to invent and do research work. The army offered little opportunity in this field. What with jumping from Mexico to Canada and from Cuba to Europe, there was little time for research or invention. So he left the

Stove handles put the molder on a HOT SPOT.
◆ ◆ ◆ Combining heat-resistance with beauty and high-finish is one of the most difficult orders you can give a molder. The fact that American Insulator makes more stove handles for more stove manufacturers than does any other molder in the country is one good indication of the superiority of our plant, our experience and our technical skill. Whatever your requirements, this superiority can serve you in producing a better product at lower cost.
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Today, the instant acclaim these valve wheels have won proves the value of Diemolding Research methods. Though jobs seldom demand two years . . . or even two months' research, it is important to know that Diemolding Corporation is willing to spend its money and time to insure the perfection of the products it makes for you.

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army. He invented a pencil sharpener which sold quickly and furnished the necessary funds for his first experiments with the Schick magazine razor. This invention when sold furnished the funds for the first Dry Shaver efforts which were discouraging. No one but Colonel Schick believed it could be made. No motor could be made that small and still be dependable he was told Several electric companies tried it without result.

He finally engaged electrical engineers to work out the problem, but when he saw that they were following along orthodox lines, he set up his own laboratory and went into seclusion to work along entirely new lines. Not being an electrical engineer himself, he had no established rules to live down.

He set about the development of his motor on an entirely new theory and was really surprised to find that it worked. Now, after nearly three years, the original model is still working The new motor with assembled mechanism was placed in a handle or housing which was cut out of a solid block of Bakelite by hand. The original model of this current Model S was made likewise and it took four days. We illustrate it here to show the precision with which his tool makers work. Aside from a slight change in design which has since been made, the handmade model cannot be distinguished from the finished product.

Once the motor and housing had been designed, then came the problem of molding. Conventional methods wouldn't do it. It remained for the Shaw Insulator Company of Irvington, N. J., to work out the problem by transfer molding. This company has since made the housings and arms for all Schick Dry Shavers. Bakelite is used exclusively.

The steel for cutters comes from Sweden and is heat treated and fabricated in his own laboratories. Col. Schick has spent three years to get away from ball bearings which are replaced by a simple bearing which is incorporated in the new model. In assembly, every part is subject to rigid tests and inspection. Water-cooled grinders of his own invention are used to machine surfaces. All cutters are chromium-plated, then electrically cleaned. Every motor is operated on the test line for one hour, then the shaving head is attached and run for half an hour. Any sign of heating at this point sends the shaver to the test lab for examination by the Cathode Ray Oscilloscope whose little line of green light wabbles and jumps until adjustments are made. Every razor is given two serial numbers—one visible—one inside where no one can see it. Careful record is kept so that the name of the jobber or retailer who purchased each Shaver is quickly available if it is ever required.

Right now Colonel Schick is developing plans for expansion. He will establish assembly plants at strategic points to supply a world market. The first will be in Canada and the force who will man it have been at work in the Stamford plant for several months. Henry Birks & Sons, whose outstanding stores dot the Dominion, have become sole distributors for Canada.

"With the additional multiple cavity molds," says Colonel Schick, "we hope to be able this year to fill our Christmas orders before Christmas. We finished filling last Christmas' orders in March of this year—and every one was still glad to get the merchandise. None was returned and there were no cancellations!"

MR. PLASTICS MAY SOON BE KNOWN AS "BILL"

(*Continued from page 25*) way about plastics. They must, or they wouldn't buy fifteen million molded urea dishes each year from chain stores. And other millions of knives and forks with cast or molded handles. Women are delighted with them, but if you ask them what they are made of, you will get another vague reply. "Imitation bone, or ivory or some sort of composition." If you don't believe it, try it.

A few of the trade names developed by pioneers in the industry have leaked out until occasionally you will hear one of these mentioned but all too often with reference to the wrong material.

Even those on the fringe of the industry are frequently vague in their conception of just what the materials are and what may reasonably be expected of them in a definite use.

Arts and Decoration, January, 1935, in a story titled "The Synthetics Become the Real" devoted six of its valuable pages to the illustration and description of plastic products in everyday use in the home and at the office. If you look carefully, you will discover beneath each photograph—Courtesy MODERN PLASTICS magazine.

On Wednesday, May 8th, the *Brooklyn Daily Eagle* devoted three quarters of a page to a story by Eugene Du Bois titled "Who Said Depression?" Mr. Du Bois writes this: "In this Synthetic age everything from buttons to parlor walls is made of plastics—the industry that nobody (nobody of the consuming public) knows is plastics. Strangest part of all is that plastics during the depression have become the most common things in daily life, and have caused the corporations making them to bloom and blossom all over the United States." The article is well illustrated in a manner convincing to the public that the things they thought were what-do-you-call-its are really plastics. These photographs, too, were furnished by MODERN PLASTICS magazine.

On Thursday, May 16th, the *New York World-Telegram*, ran a feature article written by William Engle which told all about one of the prominent men in the industry and what he has accomplished in the plastics field.

Both newspapers made much of the fact that the rapid growth and acceptance of plastics has taken place during a period when other industry was on its way to the bleachers and to await a new inning.

But the main point is that the *World-Telegram* with a

ALWAYS EFFICIENT—HOBART MEAT CHOPPERS ARE NOW MORE SANITARY... MORE BEAUTIFUL

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Butcher shops must look as up to the minute and clean as hospitals these days . . . so Hobart turned to plastics for its new, modern motor and gear housing. But such large moldings, particularly for vibrating, frequently used, long-lived machinery, are ticklish jobs.

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Pyrocon taking bakelite mold temperatures.

IMPORTANT ANNOUNCEMENT *to the* PLASTIC INDUSTRY

The publishers of Thomas' Register of American Manufacturers will issue in supplementary form about June 1, 1935, the Plastic Section of Thomas' Register. This section will contain complete lists of the Manufacturers and Fabricators of all types of Plastic Materials. It will also contain a technical explanation for each type of Plastic. 8000 copies will be distributed to important buyers of Plastics and to others interested in this industry.

An advance dummy of this section is now available. Ask to see a copy to be sure *that your Company is properly listed.* There is no obligation. Prompt action is important, as this section is now in preparation for publication.

THOMAS PUBLISHING COMPANY
467 EIGHTH AVENUE NEW YORK, N. Y.

circulation in excess of 400,000 in Metropolitan New York and that the *Brooklyn Daily Eagle* with another circulation of 95,000 among the real home folks of Brooklyn has given plastics one of its first opportunities of being introduced to these people by its right name. Mind you, the introduction at its best was by its surname. Sooner or later as individual manufacturers begin to label their product so that its trade mark appears on every piece, and as soon as they begin to carry the story of intrinsic value into these homes through newspaper and magazine advertising, plastic products will begin to be known by their first names and will become one of the family instead of entering homes as they do today, as strangers.

--AND ONLY A DIME

(*Continued from page 38*) The substantial rim at the base and the periphery gives I-beam strength of construction which lifts Old Topper out of the fragile class, yet its light weight combined with this structural strength makes it easy to ship without elaborate protective packing.

The neat general appearance of this lustrous black bowl is amplified by the well-designed paraffined cover in black, red and blue which is more than likely to get attention on display. The low price of Old Topper and its after use as a sensible ash tray would indicate that it is destined to do well in this plastic age.

Credit: to Bakelite Corporation for Bakelite, and to Plano Molding and Machine Co., Plano, Ill., for molding.

THE USE OF MOLDED PLASTICS IN APPLYING WOOD VENEER

(*Continued from page 42*) any bond at all, and the recording of a time of molding in the table of data indicates that the sample was successfully bonded and stood the steaming test.

DATA AND RESULTS

Pressure, Lbs. per Sq. In.	*Temperature, ° F.*	*Molding Time, Minutes*
1000	200–225	No bond after 45
1000	250–275	No bond after 45
1000	325–350	Poor bond after 20
1000	375–400	Poor bond after 20
1500	200–225	No bond after 45
1500	250–275	No bond after 45
1500	325–350	Poor bond after 20
1500	375–400	Poor bond after 20
2000	200–225	No bond after 45
2000	250–275	Bond after 20
2000	325–350	Bond after 6–7
2000	375–400	Bond after 5–6

2500	200–225	No bond after 45
2500	250–275	Bond after 16
2500	325–350	Bond after 6
2500	375–400	Bond after 6

Experiments indicated that it is inadvisable to use pressures above 3000 lbs. per sq. in. At such high pressures the resin, upon melting, diffuses through the wood and causes it to become weak and easily deformed. The above experiments indicate a minimum temperature of 250–275° F. and a minimum pressure of 2000 lbs.

To determine the comparative strength of the resin bond to the ordinary glue bond, samples of commercial three ply, maple with glue bond were steamed along with the other samples. The glue bonded samples failed completely within 15 minutes of steaming. It is therefore apparent that the resin bond is at least eight times as strong as the ordinary glue and possibly this figure is not high enough since the resin bond had not failed after the two-hour interval.

Conclusions

1. It is apparent that phenol-formaldehyde resin has industrial possibilities as a bond for veneer.
2. The chief consideration is the cost of the molding operation.
3. Results show that a satisfactory product can be produced by molding the veneer which has been coated with a 15% solution of resin in acetone at a pressure of 2000 lbs. per sq. in. for about 6 minutes at a temperature of 325–350° F.
4. The product thus obtained is more than eight times as resistant to warping and peeling as the glued plywood now produced.
5. One pound of resin will cover about 10 sq. yds. of surface.
6. Cost might be decreased by recovering the acetone evaporated during the drying operation.
7. This operation will require a perfectly aligned press since slight errors in levels will give a board of uneven dimensions.

Acknowledgment

The authors are indebted to Mr. Eugene E. Collins for the supply of the lumber and three ply veneer required.

LAMINATED UREAS

(*Continued from page 15*) of lighting construction in public places where there has always been the danger of breakage and injury to persons.

Lighting engineers have already given a warm reception to this new plastic and a more comprehensive study is now under way. Laminating companies are devoting considerable effort to its further development and application in the lighting field. Engineering test and design are being undertaken by competent lighting engineers who foresee the future of plastics in numerous

Your Gage

tells your steam pressure . .

not temperature

The molder who depends solely upon steam pressure for temperature determination will find himself in trouble sooner or later because of lack of uniformity of his product. Too many factors, such as water logging, number of molds in use and even atmospheric conditions, may affect mold temperatures without indication of rise or fall of steam pressure. The frequent use of the Cambridge Mold Pyrometer is the safe and easy way. It takes the temperature of the mold directly.

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light uses in the home, public building, transport and commercial places.

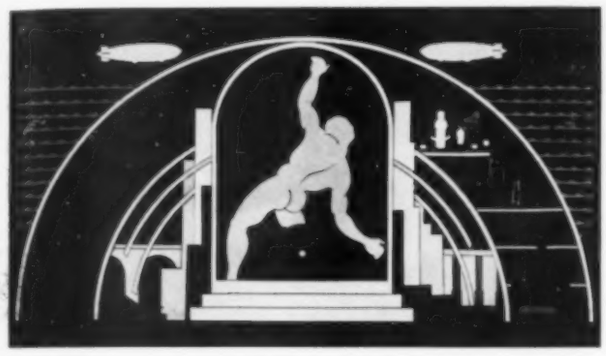
While at first it appeared that laminated materials would be too expensive to find a wide application in the building trade, it will be seen from the fact of its light weight, ease of fabrication and inexpensive erection, that laminated will readily compete with other building materials and wider demand will undoubtedly see lower costs in production.

Both translucent and opaque laminated plastics unite to march together in the building of the future, and that they are gaining rapidly in popularity is supported by

Taverns and Bars have undoubtedly constituted the widest recent use of this material. Its resistance to alcoholic liquors and its durability, together with decorative effect, has made it well suited to the hard usage it has encountered in this service. Here is the service bar of a cafeteria in Baltimore, Md., done in light orange; and above, the Marionette Coffee Shop of Alice Foot MacDougal on East 23rd Street, New York, which has dark red counters with light red borders. Back bar has dark red tops

the ever increasing interest evinced by architects and designers in this modern material. Although the total number of installations remains small in proportion to the latent possibilities, the early promise of urea plastics has been abundantly fulfilled in terms of quality and effectiveness for building purposes.

This mural at the Century of Progress in Chicago shows its decorative possibilities with brilliant colors



RALPH WALKER vs. LIMITATIONS

(*Continued from page 12*) the way. As he logically points out, the apparent value of an article depends on its design—which involves the logical realization of the intrinsic beauties of the materials as well as the more abstract properties of proportion and style. The phenolic products have textural and color properties—as well as the more obvious practical ones—which deserve a greater development than they have as yet received.

In summary Mr. Walker is interested in and optomistic about synthetic plastics and their probable development. In the accessories field, he feels that cast resins are susceptible of immediate development. As regards the laminated and molded plastics for building use, he feels that they have been developed far enough for immediate use in marine work, but that as regards housing, they are not yet ready for the following reasons:

1. No practical method of installation has been demonstrated to architects by those who make and sell the materials.
2. Their cost, as compared with plywood, transite and gypsum products, is high.
3. They are brittle.
4. They have an unpleasant wall texture because of an affinity for grease.

It is his personal opinion that that material shall have the greatest potential market in housing which shall combine the textural and structural qualities of plywood, asbestos products or gypsum products with those of synthetic plastics, and do it at something under $0.25 a square foot.

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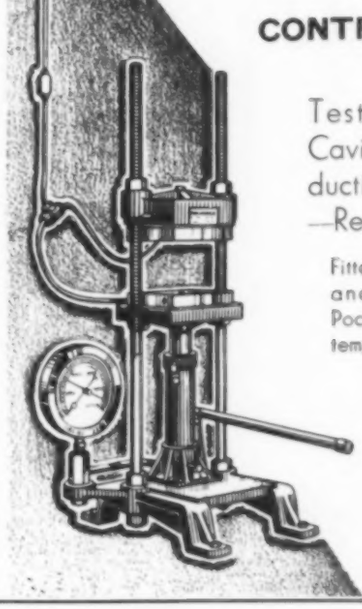

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